Contestant Number: _____

Time: _____

Rank: _____

NETWORK ADMINISTRATION USING CISCO®
(315)

REGIONAL 2020

TOTAL POINTS _____ *(500 points)*

Failure to adhere to any of the following rules will result in disqualification:
1. **Contestant must hand in this test booklet and all printouts. Failure to do so will result in disqualification.**
2. **No equipment, supplies, or materials other than those specified for this event are allowed in the testing area. No previous BPA tests and/or sample tests or facsimile (handwritten, photocopied, or keyed) are allowed in the testing area.**
3. **Electronic devices will be monitored according to ACT standards.**

No more than sixty (60) minutes testing time

Choose the *best* answer to the following questions. Mark answers clearly if using a scantron form. Mark A if the statement is true. Mark B if the statement is false.

1. A user is having problems accessing the Internet. The command **ping www.cisco.com** fails. However, pinging the IP address of cisco.com with the command **ping 198.133.219.25** is successful. What is the problem?
   a. The web server is down.
   b. The default gateway is incorrect.
   c. There is a problem with DNS.
   d. The address of the ARP cache is incorrect.

2. Which option shows the proper notation for an IPv6 address?
   a. 2001,0db8,3c55,0015,abcd,ff13
   b. 2001-0db8-3c55-0015-abcd-ff13
   c. 2001.0db8.3c55.0015.abcd.ff13
   d. 2001:0db8:3c55:0015::abcd:ff13

3. What is the purpose of the routing process?
   a. to encapsulate data that is used to communicate across a network
   b. to select the paths that are used to direct traffic to destination networks
   c. to convert a URL name into an IP address
   d. to forward traffic on the basis of MAC addresses

4. Which device should be used for enabling a host to communicate with another host on a different network?
   a. switch
   b. hub
   c. router
   d. host

5. Why would a network administrator use the **tracert** utility?
   a. to determine the active TCP connections on a PC
   b. to check information about a DNS name in the DNS server
   c. to identify where a packet was lost or delayed on a network
   d. to display the IP address, default gateway, and DNS server address for a PC

6. Which subnet would include the address 192.168.1.96 as a usable host address?
   a. 192.168.1.64/26
   b. 192.168.1.32/27
   c. 192.168.1.32/28
   d. 192.168.1.64/29

7. A technician uses the **ping 127.0.0.1** command. What is the technician testing?
   a. the TCP/IP stack on a network host
   b. connectivity between two adjacent Cisco devices
   c. connectivity between a PC and the default gateway
   d. connectivity between two PCs on the same network

8. Refer to the exhibit.
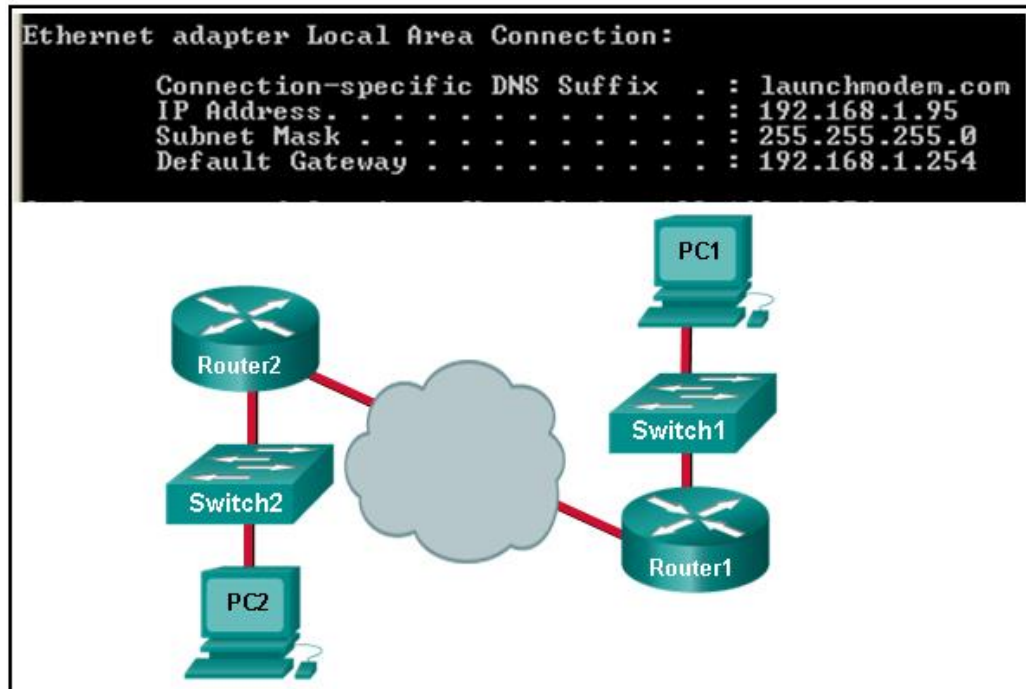
Consider the IP address configuration shown from PC1. What is a description of the default gateway address?
   a. IP address of the Router1 interface that connects the company to the Internet.
   b. IP address of the Router1 interface that connects the PC1 LAN to Router1.
   c. IP address of Switch1 that connects PC1 to other devices on the same LAN.
   d. IP address of the ISP network device located in the cloud.

9. A network technician is attempting to configure an interface by entering the following command: SanJose(config)#**ip address 192.168.2.1 255.255.255.0.** The command is rejected by the device. What is the reason for this?
   a. The command is being entered from the wrong mode of operation.
   b. The command syntax is wrong.
   c. The subnet mask information is incorrect.
   d. The interface is shutdown and must be enabled before the device will accept the IP address.

10. A network administrator is troubleshooting connectivity issues on a server. Using a tester, the administrator notices that the signals generated by the server NIC are distorted and not usable. In which layer of the OSI model is the error categorized?
    a. presentation layer
    b. network layer
    c. physical layer
    d. data link layer

11. Which connection provides a secure CLI session with encryption to a Cisco switch?
    a. a console connection
    b. an AUX connection
    c. a Telnet connection
    d. an SSH connection

12. Refer to the exhibit.

```
Switch1> config t
            ^
% Invalid input detected at '^' marker.
```

An administrator is trying to configure the switch but receives the error message that is displayed in the exhibit. What is the problem?
    a. The entire command, **configure terminal**, must be used
    b. The administrator is already in global configuration mode
    c. The administrator must first enter privileged EXEC mode before issuing the command
    d. The administrator must connect via the console port to access global configuration mode

13. Which keys act as a hot key combination that is used to interrupt an IOS process?
    a. Ctrl-Shift-X
    b. Ctrl-Shift-6
    c. Ctrl-Z
    d. Ctrl-C

14. Refer to the exhibit.

```
Enter configuration commands, one per line.  End with CNTL/Z.
SW1(config)# enable password letmein
SW1(config)# enable secret secretin
SW1(config)# line console 0
SW1(config-line)# password lineconin
SW1(config-line)# login
SW1(config-line)# exit
SW1(config)# line vty 0 15
SW1(config-line)# password linevtyin
SW1(config-line)# login
SW1(config-line)# end
SW1#
```

A network administrator is configuring access control to switch SW1. If the administrator uses Telnet to connect to the switch, which password is needed to access user EXEC mode?
    a. letmein
    b. secretin
    c. lineconin
    d. linevtyin

15. A network administrator enters the **service password-encryption** command into the configuration mode of a router. What does this command accomplish?
    a. encrypts passwords as they are transmitted across serial WAN links
    b. prevents someone from viewing the running configuration passwords
    c. enables a strong encryption algorithm for the **enable secret password** command
    d. automatically encrypts passwords in configuration files that are currently stored in NVRAM

16. What is the purpose of the SVI on a Cisco switch?
    a. provides a physical interface for remote access to the switch
    b. provides a faster method for switching traffic between ports on the switch
    c. adds Layer 4 connectivity between VLANs
    d. provides a virtual interface for remote access to the switch

17. What PDU is associated with the transport layer?
    a. segment
    b. packet
    c. frame
    d. bits

18. What type of communication medium is used with a wireless LAN connection?
    a. fiber
    b. radio waves
    c. microwave
    d. UTP

19. A technician has been asked to develop a physical topology for a network that provides a high level of redundancy. Which physical topology requires that every node is attached to every other node on the network?
    a. bus
    b. hierarchical
    c. mesh
    d. ring

20. What type of communication rule would best describe CSMA/CD?
    a. access method
    b. flow control
    c. message encapsulation
    d. message encoding

21. What will a Layer 2 switch do when the destination MAC address of a received frame is not in the MAC table?
    a. It initiates an ARP request
    b. It broadcasts the frame out of all ports on the switch
    c. It notifies the sending host that the frame cannot be delivered
    d. It forwards the frame out of all ports except for the port at which the frame was received.

22. Refer to the exhibit.

```
C:\Windows\system32> netstat -r
<output omitted>

IPv6 Route Table
===========================================================
Active Routes:
 If Metric Network Destination        Gateway
  9     306 ::/0                       On-link
  1     306 ::1/128                    On-link
  9     306 2001::/32                  On-link
  9     306 2001:0:9d38:6ab8:30d0:115:3f57:fe4c/128
                                       On-link
  4     281 fe80::/64                  On-link
  9     306 fe80::/64                  On-link
  4     281 fe80::1c20:5d8b:4b44:bd40/128
                                       On-link
  9     306 fe80::30d0:115:3f57:fe4c/128
                                       On-link
  1     306 ff00::/8                   On-link
  4     281 ff00::/8                   On-link
  9     306 ff00::/8                   On-link
===========================================================
```

A user issues the command **netstat –r** on a workstation. Which IPv6 address is one of the link-local addresses of the workstation?
   a. ::1/128
   b. fe80::30d0:115:3f57:fe4c/128
   c. fe80::/64
   d. 2001:0:9d38:6ab8:30d0:115:3f57:fe4c/128

23. What is the valid most compressed format possible of the IPv6 address 2001:0DB8:0000:AB00:0000:0000:0000:1234?
   a. 2001:DB8:0:AB00::1234
   b. 2001:DB8:0:AB::1234
   c. 2001:DB8::AB00::1234
   d. 2001:DB8:0:AB:0:1234

24. At a minimum, which address is required on IPv6-enabled interfaces?
   a. link-local
   b. unique local
   c. site local
   d. global unicast

25. An IPv6 enabled device sends a data packet with the destination address of FF02::2. What is the target of this packet?
   a. all IPv6 enabled devices across the network
   b. all IPv6 enabled devices on the local link
   c. all IPv6 DHCP servers
   d. all IPv6 configured routers on the local link

26. What is the usable number of host IP addresses on a network that has a /26 mask?
    a. 256
    b. 254
    c. 64
    d. 62

27. Refer to the exhibit.
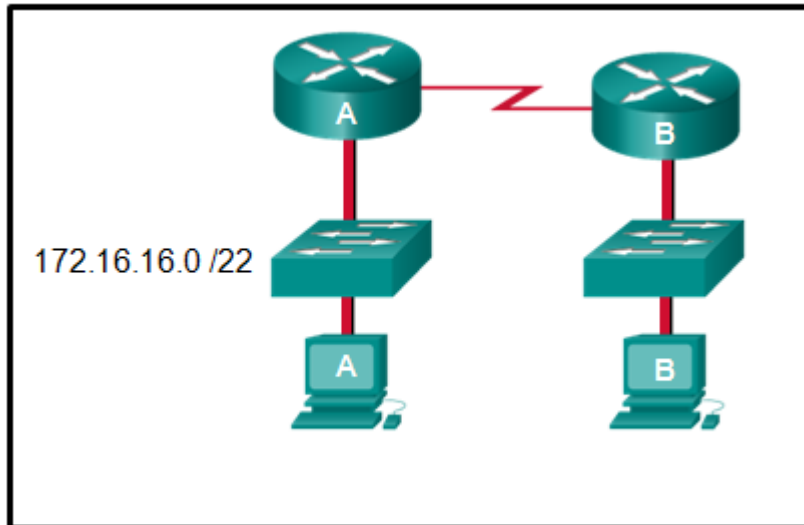
An administrator must send a message to everyone on the router A network.
What is the broadcast address for network 172.16.16.0/22?
    a. 172.16.16.255
    b. 172.16.20.255
   c. 172.16.19.255
    d. 172.16.23.255

28. A network administrator is variably subnetting a given block of IPv4 addresses. Which combination of network addresses and prefix lengths will make the most efficient use of addresses when the need is for 2 subnets capable of supporting 10 hosts and 1 subnet that can support 6 hosts?
    a. 10.1.1.128/28
       10.1.1.144/28
       10.1.1.160/29
    b. 10.1.1.128/28
       10.1.1.144/28
       10.1.1.160/28
    c. 10.1.1.128/28
       10.1.1.140/28
       10.1.1.158/26
    d. 10.1.1.128/26
       10.1.1.144/26
       10.1.1.158/28

29. Given IPv6 address prefix 2001:db8::/48, what will be the last subnet that is created if the subnet prefix is changed to /52?
    a. 2001:db8:0:f00::/52
    b. 2001:db8:0:8000::/52
    c. 2001:db8:0:f::/52
    d. 2001:db8:0:f000::/52

30. What will be the result of failed login attempts if the following command is entered into a router?

    login block-for 150 attempts 4 within 90

    a. All login attempts will be blocked for 150 seconds if there are 4 failed attempts within 90 seconds
    b. All login attempts will be blocked for 90 seconds if there are 4 failed attempts within 150 seconds
    c. All login attempts will be blocked for 1.5 hours if there are 4 failed attempts within 150 seconds
    d. All login attempts will be blocked for 4 hours if there are 90 failed attempts within 150 seconds

31. The buffers for packet processing and the running configuration file are temporarily stored in which type of router memory?
    a. flash
    b. NVRAM
    c. RAM
    d. ROM

32. Refer to the exhibit.
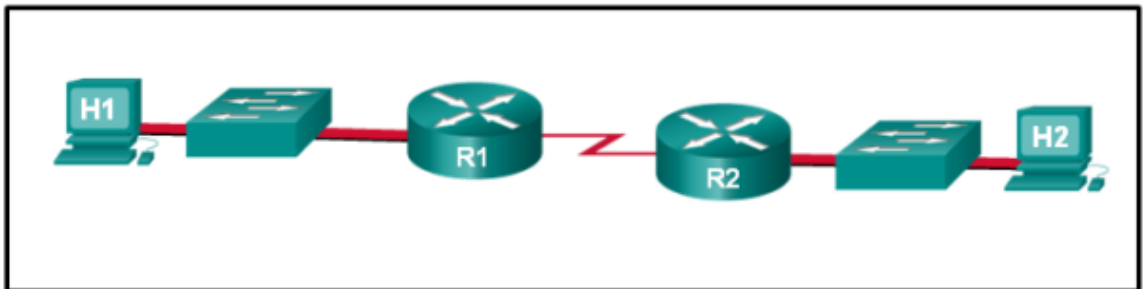
Assuming that the routing tables are up to date and no ARP messages are needed, after a packet leaves H1, how many times is the L2 header rewritten in the path to H2?
    a. 1
    b. 2
    c. 3
    d. 4

33. What command will enable a router to begin sending messages that allow it to configure a link-local address without using an IPv6 DHCP server?
    a. the **ipv6 route ::/0** command
    b. a static route
    c. the **ip routing** command
    d. the **ipv6 unicast-routing** command

34. Refer to the exhibit.

```
C  192.168.2.0/24 is directly connected, Serial0/0/0

S  10.0.2.0/24 is directly connected, Serial 0/0/0

S  0.0.0.0/0 [1/0] via 192.168.2.2

S  10.0.2.0/24 [1/0] via 192.168.2.2
```

Which route was configured as a static route to a specific network using the next-hop address?
    a. C   192.168.2.0/24 is directly connected, Serial0/0/0
    b. S   10.0.2.0/24 is directly connected, Serial0/0/0
    c. S   0.0.0.0/0 [1/0] via 192.168.2.2
    d. S   10.0.2.0/24 [1/0] via 192.168.2.2

35. Refer to the exhibit.

```
ipv6 route 2001:0DB8::/32 2001:0DB8:3000::1
```

Which type of IPv6 static route is configured in the exhibit?
    a. directly attached static route
    b. recursive static route
    c. fully specified static route
    d. floating static route

36. A network administrator has entered the following command:

ip route 192.168.10.64 255.255.255.192 serial0/0/1

When the network administrator enters the command **show ip route**, the route is not in the routing table. What should the administrator do next?
    a. Re-enter the command using the correct mask.
    b. Verify that the Serial0/0/1 interface is active and available
    c. Verify that the 192.168.10.64 network is active within the network infrastructure
    d. Re-enter the command using a network number rather than a usable IP address

37. Refer to the exhibit.
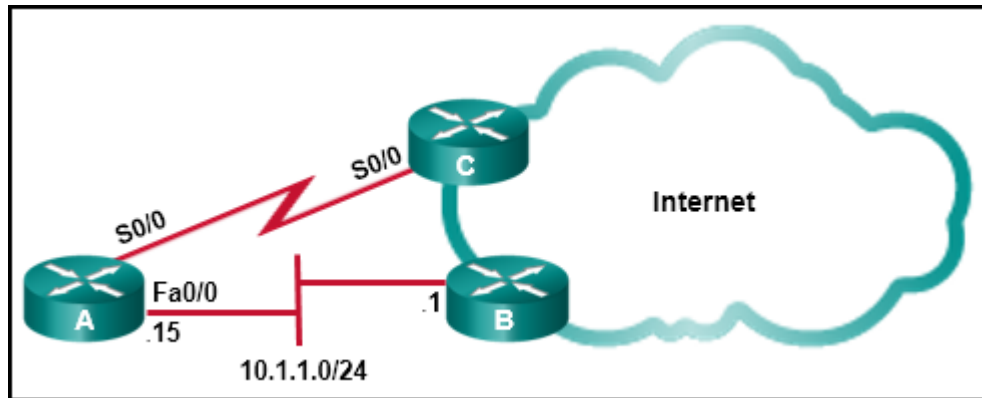
This network has two connections to the ISP, one via router C and one via router B. The serial link between router A and router C supports EIGRP and is the primary link to the Internet. If the primary link fails, the administrator needs a floating static route that avoids recursive route lookups and any potential next-hop issues caused by the multiaccess nature of the Ethernet segment with router B. What should the administrator configure?
   a. Create a static route pointing to Fa0/0 with an AD of 1.
   b. Create a static route pointing to 10.1.1.1 with an AD of 1.
   c. Create a static route pointing to 10.1.1.1 with an AD of 95.
   d. Create a fully specified static route pointing to Fa0/0 with an AD of 95

38. Refer to the exhibit.

```
D      172.16.0.0/22 [90/2172416] via 172.16.4.1, 00:13:47, Serial0/0/1
C      172.16.4.0/30 is directly connected, Serial0/0/1
C      172.16.4.64/26 is directly connected, FastEthernet0/0
D      172.16.100.0/30 [90/2681856] via 172.16.4.1, 00:13:47, Serial0/0/1
D      172.16.100.64/26 [90/2684416] via 172.16.4.1, 00:13:47, Serial0/0/1
D*EX 0.0.0.0/0 [170/7801856] via 172.16.4.1, 00:13:47, Serial0/0/1
```
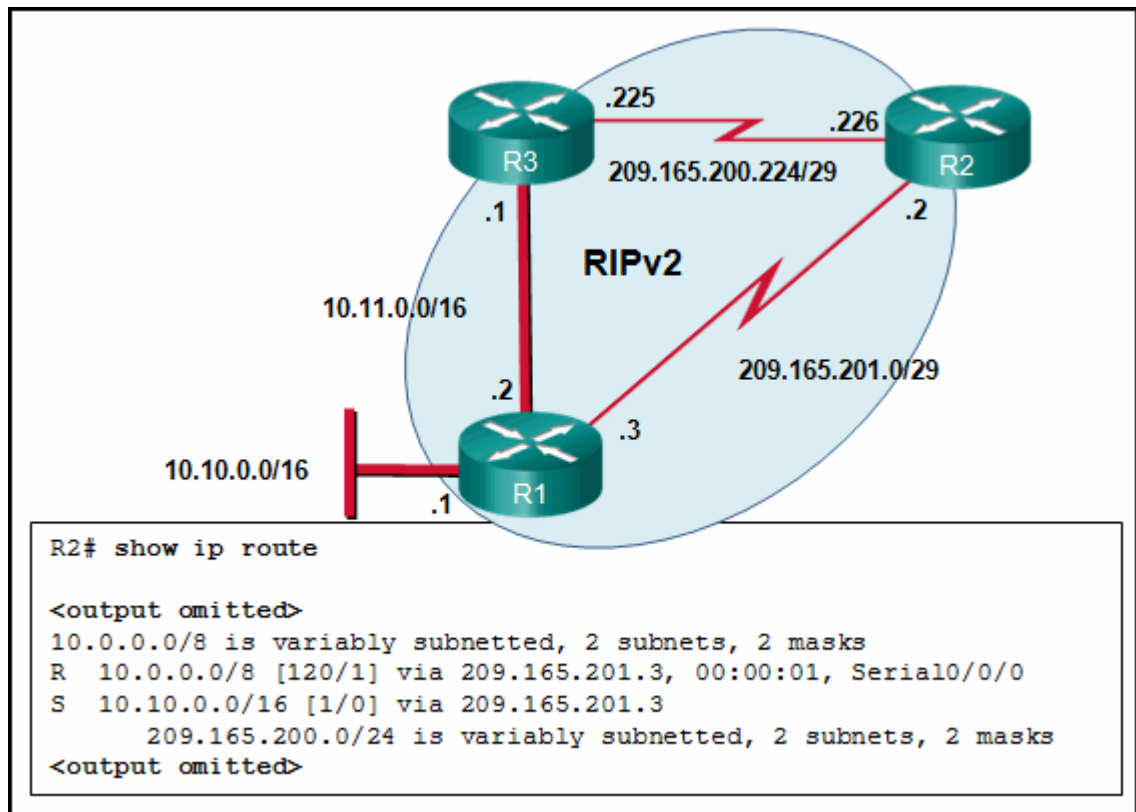
How did the router obtain the last route that is shown?
   a. The **ip route** command was used
   b. The **ipv6 route** command was used
   c. Another router in the same organization provided the default route by using a dynamic routing protocol
   d. The **ip address** interface configuration mode command was used in addition to the **network** routing protocol configuration mode command.

39. To enable RIP routing for a specific subnet, the configuration command **network 192.168.5.64** was entered by the network administrator. What address, if any, appears in the running configuration file to identify this network?
   a. 192.168.5.64
   b. 192.168.5.0
   c. 192.168.0.0
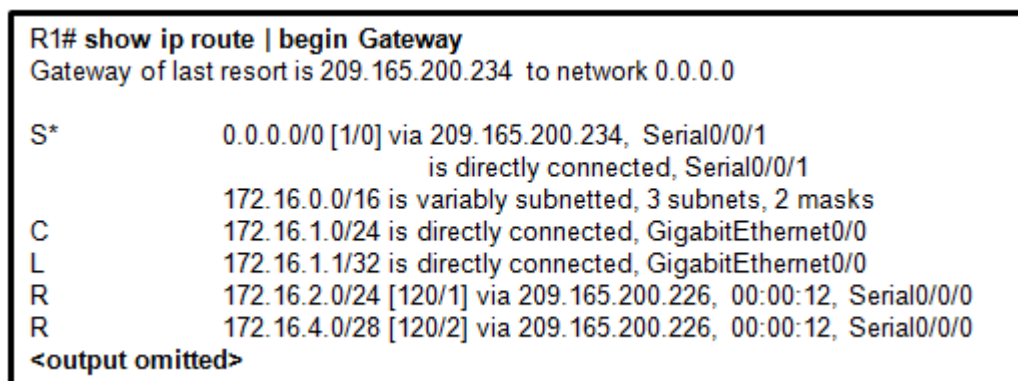   d. No address is displayed

40. Refer to the exhibit.


```
R2# show ip route

<output omitted>
10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
R   10.0.0.0/8 [120/1] via 209.165.201.3, 00:00:01, Serial0/0/0
S   10.10.0.0/16 [1/0] via 209.165.201.3
       209.165.200.0/24 is variably subnetted, 2 subnets, 2 masks
<output omitted>
```

What is the administrative distance value that indicates the route for R2 to reach the 10.10.0.0/16 network?

   a. 1
   b. 120
   c. 0
   d. 2

41. Refer to the exhibit.

```
R1# show ip route | begin Gateway
Gateway of last resort is 209.165.200.234 to network 0.0.0.0

S*              0.0.0.0/0 [1/0] via 209.165.200.234, Serial0/0/1
                         is directly connected, Serial0/0/1
                172.16.0.0/16 is variably subnetted, 3 subnets, 2 masks
C               172.16.1.0/24 is directly connected, GigabitEthernet0/0
L               172.16.1.1/32 is directly connected, GigabitEthernet0/0
R               172.16.2.0/24 [120/1] via 209.165.200.226, 00:00:12, Serial0/0/0
R               172.16.4.0/28 [120/2] via 209.165.200.226, 00:00:12, Serial0/0/0
<output omitted>
```

Which type of route is 172.16.0.0/16?
   a. child route
   b. ultimate route
   c. default route
   d. level 1 parent route

42. In an IPv6 routing table, all routing table entries are classified as which type of routes?
    a. level 1 parent routes
    b. level 1 ultimate routes
    c. level 2 child routes
    d. level 1 network routes

43. What is the name of the layer in the Cisco borderless switched network design that would have more switches deployed than other layers in the network design of a large organization?
    a. access
    b. core
    c. data link
    d. network

44. What is a function of the distribution layer?
    a. fault isolation
    b. network access to the user
    c. high-speed backbone connectivity
    d. interconnection of large-scale networks in wiring closets

45. Which network design principle focuses on the capability of on-demand seamless network expansion in a switched network?
    a. flexibility
    b. resiliency
    c. modularity
    d. hierarchical

46. A lab in a network management software company is configuring a testing environment to verify the performance of new software with different network connectivity speeds, including FastEthernet, GigabitEthernet, and 10 GigabitEthernet, and with copper and fiber optic connections. Which type of switch should the software company purchase to perform the tests?
    a. fixed configuration
    b. modular configuration
    c. stackable
    d. access layer

47. What information is added to the switch table from incoming frames?
    a. source MAC address and incoming port number
    b. destination MAC address and incoming port number
    c. source IP address and incoming port number
    d. destination IP address and incoming port number

48. A network technician is configuring port security on switches. The interfaces on the switches are configured in such a way that when a violation occurs, packets with unknown source addresses are dropped and no notification is sent. Which violation mode is configured on the interfaces?
    a. off
    b. restrict
    c. protect
    d. shutdown

49. After sticky learning of MAC addresses is enabled, what action is needed to prevent dynamically learned MAC addresses from being lost in the event that an associated interface goes down?
    a. Shut down the interface then enable it again with the **no shutdown** command.
    b. Configure port security for violation protect mode.
    c. Reboot the switch.
    d. Copy the running configuration to the startup configuration.

50. Refer to the exhibit.
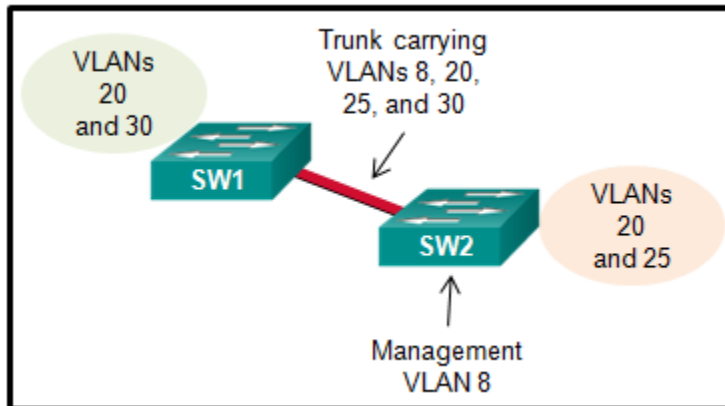
A small business uses VLANs 8, 20, 25, and 30 on two switches that have a trunk link between them. What native VLAN should be used on the trunk if Cisco best practices are being implemented?
    a. 1
    b. 5
    c. 8
    d. 20