Chapter

1

Network Fundamentals (Domain 1)

THE CCNA EXAM TOPICS COVERED IN THIS PRACTICE TEST INCLUDE THE FOLLOWING:

✓ **1.0 Network Fundamentals (ICND1)**

- 1.1 Compare and contrast OSI and TCP/IP models (ICND1)

- 1.2 Compare and contrast TCP and UDP protocols (ICND1)

- 1.3 Describe the impact of infrastructure components in an enterprise network (ICND1)

- 1.4 Describe the effects of cloud resources on enterprise network architecture (ICND2)

- 1.5 Compare and contrast collapsed core and three-tier architectures (ICND1)

- 1.6 Compare and contrast network topologies (ICND1)

- 1.7 Select the appropriate cabling type based on implementation requirements (ICND1)

- 1.8 Apply troubleshooting methodologies to resolve problems (ICND1)

- 1.9 Configure, verify, and troubleshoot IPv4 addressing and subnetting (ICND1)

- 1.10 Compare and contrast IPv4 address types (ICND1)

- 1.11 Describe the need for private IPv4 addressing (ICND1)

- 1.12 Identify the appropriate IPv6 addressing scheme to satisfy addressing requirements in a LAN/WAN environment (ICND1)

- 1.13 Configure, verify, and troubleshoot IPv6 addressing (ICND1)

- 1.14 Configure and verify IPv6 Stateless Address Autoconfiguration (ICND1)

- 1.15 Compare and contrast IPv6 address types (ICND1)

1. Which statement is a valid reason the OSI reference model was created?

   A. It encourages vendors to create proprietary standards for any component of the OSI.

   B. It allows for changes on one layer to apply to another layer so they can work together.

   C. It prevents industry standardization of network processes.

   D. It divides network communication into smaller components for design and trouble-shooting.

2. When a program uses encryption such as SSL, which layer is responsible?

   A. Presentation layer

   B. Transport layer

   C. Data Link layer

   D. Session layer

3. Which device would primarily function at the Data Link layer?

   A. Routers

   B. Firewalls

   C. Gateways

   D. Switches

4. Which is the proper order of the OSI layers?

   A. Application, Transport, Session, Presentation, Network, Data Link, Physical

   B. Presentation, Application, Session, Transport, Network, Data Link, Physical

   C. Application, Presentation, Session, Transport, Network, Data Link, Physical

   D. Application, Presentation, Transport, Network, Session, Data Link, Physical

5. Which OSI layer is responsible for logical addressing?

   A. Transport layer

   B. Network layer

   C. Application layer

   D. Data Link layer

6. Which OSI layer is responsible for connection-oriented communication?

   A. Transport layer

   B. Presentation layer

   C. Data Link layer

   D. Application layer

7. Which layer is responsible for compression and decompression?

   A. Application layer

   B. Physical layer

   C. Session layer

   D. Presentation layer

8. Which layer of the OSI is responsible for dialog control of applications?

A. Application layer

B. Physical layer

C. Session layer

D. Network layer

9. At which layer of the OSI can you find DTE and DCE interfaces?

A. Application layer

B. Physical layer

C. Session layer

D. Transport layer

10. At which DoD model layer does Telnet, TFTP, SNMP, and SMTP function?

A. Host-to-Host layer

B. Process/Application layer

C. Internet layer

D. Network Access layer

11. An administrator is checking to make sure that SNMP is working properly. Which is the highest layer checked in the OSI if it is working successfully?

A. Application layer

B. Presentation layer

C. Session layer

D. Network layer

12. The receiving computer checked the checksum of a frame. It had been damaged during transfer, so it is discarded. At which layer of the OSI did this occur?

A. Physical layer

B. Data Link layer

C. Network layer

D. Session layer

13. Which layer in the DoD model is responsible for routing?

A. Host-to-Host layer

B. Process/Application layer

C. Internet layer

D. Network Access layer

14. Which devices create collision domains, raising effective bandwidth?

A. Firewalls

B. Hubs

C. Routers

D. Switches

15. Which device acts like a multiport repeater?

    A. Firewall

    B. Hub

    C. Router

    D. Switch

16. Which layer of the OSI defines the PDU, or protocol data unit, of segments?

    A. Application layer

    B. Session layer

    C. Network layer

    D. Transport layer

17. Which device will create broadcast domains and raise effective bandwidth?

    A. Firewall

    B. Hub

    C. Router

    D. Switch

18. Which is a correct statement about MAC addresses?

    A. Organizationally unique identifiers (OUIs) create a unique MAC address.

    B. The first 24 bits of a MAC address is specified by the vendor.

    C. The IEEE is responsible for MAC address uniqueness.

    D. If the I/G bit is set to 1, then the frame identifies a broadcast or multicast.

19. Which access/contention method is used for Ethernet?

    A. CSMA/CA

    B. CSMA/CD

    C. 802.2

    D. Token passing

20. What is the correct order of encapsulation?

    A. User datagrams, packets, segments, frames, bits

    B. User datagrams, sessions, segments, packets, frames, bits

    C. User datagrams, segments, packets, frames, bits

    D. Bits, frames, sessions, packets, user datagrams

21. Which application provides terminal emulation over a network?

    A. SNMP

    B. Telnet

    C. HTTP

    D. TFTP

22. Which protocol is responsible for identifying upper-layer network protocols at the Data Link layer?

   A. LLC

   B. MAC

   C. 802.3

   D. FCS

23. The translation of ASCII to EBCDIC is performed at which layer of the OSI?

   A. Application layer

   B. Session layer

   C. Presentation layer

   D. Data Link layer

24. Which is not a common cause for LAN congestion?

   A. Broadcasts

   B. Multicasts

   C. Adding switches for connectivity

   D. Using multiple hubs for connectivity

25. Flow control can be found at which layer of the OSI?

   A. Transport layer

   B. Network layer

   C. Data Link layer

   D. Session layer

26. Which protocol requires the programmer to deal with lost segments?

   A. SSL

   B. TCP

   C. UDP

   D. NMS

27. Which is a correct statement about the Transmission Control Protocol (TCP)?

   A. TCP is a connectionless protocol.

   B. TCP allows for error detection and correction.

   C. TCP is faster than UDP.

   D. TCP allows for retransmission of lost segments.

28. Which statement correctly describes what happens when a web browser initiates a request to a web server?

   A. The sender allocates a port dynamically above 1024 and associates it with the request.

   B. The receiver allocates a port dynamically above 1024 and associates it with the request.

   C. The sender allocates a port dynamically below 1024 and associates it with the request.

   D. The receiver allocates a port dynamically below 1024 and associates it with the request.

29. Which protocol and port number is associated with SMTP?

   A. UDP/69

   B. UDP/25

   C. TCP/69

   D. TCP/25

30. How does TCP guarantee delivery of segments to the receiver?

   A. Via the destination port

   B. TCP checksums

   C. Window size

   D. Sequence and acknowledgment numbers

31. When a programmer decides to use UDP as a transport protocol, what is a decision factor?

   A. Redundancy of acknowledgment is not needed.

   B. Guaranteed delivery of segments is required.

   C. Windowing flow control is required.

   D. A virtual circuit is required.

32. Which mechanism allows for programs running on a server (daemons) to listen for requests through the process called binding?

   A. Headers

   B. Port numbers

   C. MAC address

   D. Checksums

33. Which is a correct statement about sliding windows used with TCP?

   A. The window size is established during the three-way handshake.

   B. Sliding windows allow for data of different lengths to be padded.

   C. It allows TCP to indicate which upper-layer protocol created the request.

   D. It allows the router to see the segment as urgent data.

34. Why does DNS use UDP?

   A. DNS requires acknowledgment of the request for auditing.

   B. The requests require flow control of UDP.

   C. DNS requests are usually small and do not require connections setup.

   D. DNS requires a temporary virtual circuit.

35. What is required before TCP can begin sending segments?

   A. Three-way handshake

   B. Port agreement

   C. Sequencing of segments

   D. Acknowledgment of segments

36. Which term describes what it is called when more than one wireless access point (WAP) covers the same SSID?

A. Broadcast domain

B. Basic service set

C. Extended server set

D. Wireless mesh

37. Which protocol allows a Lightweight AP (LWAP) to forward data to the wired LAN?

A. Spanning Tree Protocol (STP)

B. Bridge protocol data units (BPDUs)

C. Orthogonal Frequency Division Multiplexing (OFDM)

D. Control and Provisioning of Wireless Access Points (CAPWAP)

38. Which component allows wireless clients to roam between access points and maintain authentication?

A. Basic service set

B. Extended service set

C. Wireless LAN controller

D. Service set ID

39. Which is a valid reason to implement a wireless LAN controller (WLC)?

A. Centralized authentication

B. The use of autonomous WAPs

C. Multiple SSIDs

D. Multiple VLANs

40. You require a density of 100 wireless clients in a relatively small area. Which design would be optimal?

A. Autonomous WAPs with a WLC

B. Lightweight WAPs with a WLC

C. Autonomous WAPs without a WLC

D. Lightweight WAPs without a WLC

41. When designing a wireless network, which would be a compelling reason to use 5 GHz?

A. 5 GHz can go further.

B. 5 GHz allows for more clients.

C. There are 24 non-overlapping channels.

D. There is less interference on 5 GHz.

42. Which allows for seamless wireless roaming between access points?

    A. Single SSID

    B. Single service set

    C. 802.11ac

    D. Wireless LAN controller

43. In the 2.4 GHz spectrum for 802.11, which channels are non-overlapping?

    A. Channels 1, 3, and 11

    B. Channels 1, 3, and 6

    C. Channels 1, 6, and 11

    D. Channels 1 through 6

44. Which is one of the critical functions that a wireless LAN controller performs?

    A. Allows autonomous WAPs

    B. Synchronizes the WAPs with the same IOS

    C. Triangulates users for location lookups

    D. Allows for the use of all frequency channels

45. Which is the contention method 802.11 wireless uses?

    A. CSMA/CA

    B. CSMA/CD

    C. BSSS

    D. OFDM

46. When firewalls are placed in a network, which zone contains Internet-facing services?

    A. Outside zone

    B. Enterprise network zone

    C. Demilitarized zone

    D. Inside zone

47. According to best practices, what is the proper placement of a firewall?

    A. Only between the internal network and the Internet

    B. At key security boundaries

    C. In the DMZ

    D. Only between the DMZ and the Internet

48. Which is a false statement about firewalls?

    A. Firewalls can protect a network from external attacks.

    B. Firewalls can protect a network from internal attacks.

    C. Firewalls can provide stateful packet inspection.

    D. Firewalls can control application traffic.

49. Which of the following options is not a consideration for the management of a firewall?

A. All physical access to the firewall should be tightly controlled.

B. All firewall policies should be documented.

C. Firewall logs should be regularly monitored.

D. Firewalls should allow traffic by default and deny traffic explicitly.

50. What is the reason firewalls are considered stateful?

A. Firewalls keep track of the zone states.

B. Firewalls keep accounting on the state of packets.

C. Firewalls track the state of a TCP conversation.

D. Firewalls transition between defense states.

51. You have an Adaptive Security Appliance (ASA) and two separate Internet connections via different providers. How could you apply the same policies to both connections?

A. Place both connections into the same zone.

B. Place each connection into an ISP zone.

C. Apply the same ACL to both of the interfaces.

D. Each connection must be managed separately.

52. Why should servers be placed in the DMZ?

A. So that Internet clients can access them

B. To allow access to the Internet and the internal network

C. To allow the server to access the Internet

D. To restrict the server to the Internet

53. Which type of device will detect but not prevent unauthorized access?

A. Firewall

B. IPS

C. IDS

D. Honey pots

54. When a firewall matches a URI, it is operating at which layer?

A. Layer 7

B. Layer 5

C. Layer 4

D. Layer 3

55. In which zone should an email server be located?

A. Inside zone

B. Outside zone

C. DNS zone

D. DMZ

56. Amazon Web Services (AWS) and Microsoft Azure are examples of what?

    A. Public cloud providers

    B. Private cloud providers

    C. Hybrid cloud providers

    D. Dynamic cloud providers

57. You are looking to create a fault tolerant colocation site for your servers at a cloud provider. Which type of cloud provider would you be searching for?

    A. PaaS

    B. IaaS

    C. SaaS

    D. BaaS

58. Which allows for the distribution of compute resources such as CPU and RAM to be distributed over several operating systems?

    A. Physical server

    B. Hypervisor

    C. Virtual machine

    D. Virtual network

59. Which option describes a virtual machine (VM) best?

    A. An operating system that is running directly on hardware

    B. An operating system that is running with dedicated hardware

    C. An operating system that is running on reduced hardware features

    D. An operating system that is decoupled from the hardware

60. What is the physical hardware used in virtualization called?

    A. Host

    B. VM

    C. Hypervisor

    D. Guest

61. Which component connects the virtual machine NIC to the physical network?

    A. vNIC

    B. Trunk

    C. Virtual switch

    D. NX-OS

62. Which component acts as a distribution switch for the physical data center?

    A. Top of Rack switch

    B. End of Row switch

    C. Core switch

    D. Virtual switch

63. Which is not a NIST criteria for cloud computing?

   A. Resource pooling

   B. Rapid elasticity

   C. Automated billing

   D. Measured service

64. Which term describes an internal IT department hosting virtualization for a company?

   A. Public cloud

   B. Elastic cloud

   C. Private cloud

   D. Internal cloud

65. What is the role of a cloud services catalog?

   A. It defines the capabilities for the cloud.

   B. It defines the available VMs for creation in the cloud.

   C. It defines the available VMs running in the cloud.

   D. It defines the drivers for VMs in the cloud.

66. A hosted medical records service is an example of which cloud model?

   A. PaaS

   B. IaaS

   C. SaaS

   D. BaaS

67. A hosted environment that allows you to write and run programs is an example of which cloud model?

   A. PaaS

   B. IaaS

   C. SaaS

   D. BaaS

68. Which cloud connectivity method allows for seamless transition between public clouds?

   A. MPLS VPN

   B. Internet VPN

   C. Intercloud exchange

   D. Private WAN

69. Which statement is not a consideration when converting to an email SaaS application if the majority of users are internal?

   A. Internal bandwidth usage

   B. External bandwidth usage

   C. Location of the users

   D. Branch office connectivity to the Internet

70. Which of the following is a virtual network function (VNF) device?

   A. Virtual switch

   B. Virtual firewall

   C. Database server

   D. File server

71. You purchase a VM on a public cloud and plan to create a VPN tunnel to the cloud pro-vider. Your IP network is 172.16.0.0/12, and the provider has assigned an IP address in the 10.0.0.0/8 network. What VNF will you need from the provider to communicate with the VM?

   A. Virtual switch

   B. Virtual firewall

   C. Virtual router

   D. Another IP scheme at the provider

72. Which protocol would you use to synchronize the VM in the public cloud with an internal time source at your premise?

   A. DNS

   B. rsync

   C. NTP

   D. VPN

73. You need to scale out some web servers to accommodate load. Which method would you use?

   A. Add vCPUs.

   B. Add vRAM.

   C. Add DNS.

   D. Add SLBaaS.

74. You have several VMs in a public cloud. What is a benefit of creating NTP VNF in the public cloud for the VMs?

   A. Better time synchronization

   B. Better response time from the VMs

   C. Lower bandwidth utilization from your premises

   D. Overcoming different time zones

75. When deciding to move DNS into the cloud for an application on the public cloud, what is the primary decision factor?

   A. Bandwidth

   B. Response time

   C. Proper DNS resolution

   D. The cloud provider's requirements

76. Access layer switches in the three-tier design model perform which task?

   A.   Connect to other switches for redundancy

   B.   Connect to users

   C.   Connect campuses

   D.   Connect to the Internet

77. Distribution layer switches in the three-tier design model perform which task?

   A.   Connect to other switches for redundancy

   B.   Connect to users

   C.   Connect campuses

   D.   Connect to the Internet

78. Core layer switches in the three-tier design model perform which task?

   A.   Connect to other switches for redundancy

   B.   Connect to users

   C.   Connect campuses

   D.   Connect to the Internet

79. The two-tier design model contains which layer switches?

   A.   Core, distribution, and access

   B.   Core and distribution

   C.   Distribution and access

   D.   Internet, core, distribution, and access

80. You have one campus, which contains 2,000 PCs, and each edge switch will contain 25 to 40 PCs. Based on this layout, which design model should be used?

   A.   Collapsed-core model

   B.   Three-tier model

   C.   DOD model

   D.   Access model

81. You have four campuses, each containing 500 PCs, and each edge switch will contain 20 to 30 PCs. Based on this layout, which design model should be used?

   A.   Collapsed-core model

   B.   Three-tier model

   C.   DOD model

   D.   Access model

82. Which should only be performed at the core layer?

   A.   Routing

   B.   Supporting clients

   C.   Configuring ACLs

   D.   Switching

83. Which layer in the three-tier model is where redistribution of routing protocols should be performed?

A. Core layer

B. Distribution layer

C. Access layer

D. Routing layer

84. Which layer in the three-tier model is where collision domains should be created?

A. Core layer

B. Distribution layer

C. Access layer

D. Routing layer

85. Which is an accurate statement about the collapsed-core design concept?

A. It is best suited for large-scale networks.

B. It allows for better bandwidth.

C. It is best suited for small enterprises.

D. It bottlenecks bandwidth.

86. Which network topology design has a centralized switch connecting all of the devices?

A. Star topology

B. Full mesh topology

C. Partial mesh topology

D. Hybrid topology

87. Which is a direct benefit of a full mesh topology?

A. Increased bandwidth

B. Increased redundancy

C. Decreased switch count

D. Increased complexity

88. Where is the hybrid topology most commonly seen in the three-tier design model?

A. Core layer

B. Distribution layer

C. Access layer

D. Routing layer

89. Where is the full mesh topology commonly seen in the three-tier design model?

A. Core layer

B. Distribution layer

C. Access layer

D. Routing layer

90. Where is the star topology most commonly seen in the three-tier design model?

    A. Core layer

    B. Distribution layer

    C. Access layer

    D. Routing layer

91. Which topology does the collapsed core layer switch use in a two-tier design model?

    A. Star topology

    B. Full mesh topology

    C. Partial mesh topology

    D. Hybrid topology

92. Define a full mesh topology design.

    A. All links from the central switch connect to the edge switches.

    B. All links between switches are connected to each other redundantly.

    C. Only links between similar switch types are connected to each other redundantly.

    D. All ports are used for connecting only other switches.

93. Define a star topology design.

    A. All links from the central switch connect to the edge switches.

    B. All links between switches are connected to each other redundantly.

    C. Only links between similar switch types are connected to each other redundantly.

    D. All ports are used for connecting other switches.

94. Which topology does an autonomous WAP use?

    A. Star topology

    B. Full mesh topology

    C. Partial mesh topology

    D. Hybrid topology

95. If you had limited cable access for the distribution switches, which topology would you need to plan for?

    A. Star topology

    B. Full mesh topology

    C. Partial mesh topology

    D. Hybrid topology

96. Which cable standard delivers 1 Gb/s using four pairs of CAT5e?

    A. 1000Base-T

    B. 1000Base-SX

    C. 1000Base-LX

    D. 1000Base-X

97. Which fiber optic standard uses a 9 micron core and can span up to 10km?

    A. UTP

    B. Multi-mode

    C. Single-mode

    D. STP

98. Which cable type would you use to connect a router to a switch?

    A. Straight-through cable

    B. Crossover cable

    C. Rolled cable

    D. Shielded cable

99. What is the maximum distance you can run 1000Base-T?

    A. 100 meters

    B. 1,000 meters

    C. 100 feet

    D. 1,000 feet

100. What is the terminal specification to connect to a Cisco router or switch via serial cable?

    A. 9600 baud 8-N-0

    B. 9600 baud 8-N-1

    C. 2400 baud 8-N-1

    D. 115,200 baud 8-N-1

101. Which cable type would you use to connect a switch to a switch?

    A. Straight-through cable

    B. Crossover cable

    C. Rolled cable

    D. Shielded cable

102. Which fiber optic standard utilizes a 50 micron core?

    A. UTP

    B. Multi-mode

    C. Single-mode

    D. STP

103. Which type of cable would be used to connect a computer to a switch for management of the switch?

    A. Straight-through cable

    B. Crossover cable

    C. Rolled cable

    D. Shielded cable

104. Which specification for connectivity is currently used in data centers for cost and simplicity?

   A. 10GBase-T

   B. 40GBase-T

   C. 10GBase-CX

   D. 100GBase-TX

105. If you had an existing installation of Cat5e on your campus, what is the highest speed you could run?

   A. 10 Mb/s

   B. 100 Mb/s

   C. 1 Gb/s

   D. 10 Gb/s

106. You get a call that the Internet is down. When you investigate the Internet router and perform a `show interface serial 0/0`, you see the following status. What might be the problem?

```
Serial0/0 is administratively down, line protocol is up
  Hardware is MCI Serial
```

   A. The serial line connecting to the ISP is down.

   B. Someone accidentally shut down the serial interface.

   C. Routing to the ISP is not set correctly.

   D. The clocking from the ISP has stopped.

107. When performing troubleshooting for a routing issue, which method should be used first to isolate the problem?

   A. Pinging the destination IP back to the originating IP

   B. Pinging the originating IP to the destination IP

   C. Traceroute from the originating IP to the destination IP

   D. Traceroute from the destination IP to the originating IP

108. Which command would you run to diagnose a possible line speed or duplex issue?

   A. `Switch#show speed`

   B. `Switch#show duplex`

   C. `Switch#show interface status`

   D. `Switch#show diagnostics`

109. Which command would you use, to diagnose a problem with frames that are not getting forwarded to the destination node on a switch?

   A. `Switch#show route`

   B. `Switch#show mac address-table`

   C. `Switch#show mac table`

   D. `Switch#show interface`

110. Which command should you start with when trying to diagnose port security issues?

    A. `Switch#show port-security`

    B. `Switch#show mac address-table`

    C. `Switch#show interface`

    D. `Switch#show security`

111. After solving the root cause of a problem, what should be done?

    A. Isolate the problem.

    B. Perform root cause analysis.

    C. Escalate the problem.

    D. Monitor the solution.

112. What is the first step to troubleshooting a problem?

    A. Isolate the problem.

    B. Perform root cause analysis.

    C. Escalate the problem.

    D. Monitor the solution.

113. Which command should be used to verify that a VLAN is defined on a switch to troubleshoot a VLAN forwarding issue?

    A. `Switch#show interfaces fast 0/0 switchport`

    B. `Switch#show vlan`

    C. `Switch#show vlans`

    D. `Switch#show vtp`

114. It is reported that users cannot reach an internal server. You only have access to the local switches at your facility. You perform a `show interface fast 0/23` on the user reporting the problem and the status of the switch is up/up. What should you do next?

    A. Isolate the problem.

    B. Perform root cause analysis.

    C. Escalate the problem.

    D. Monitor the solution.

115. You just installed a new switch and you cannot get traffic forwarded to a remote VLAN. You believe there is a problem with trunking. Which command will you start with to verify trunking.

    A. `Switch#show interfaces fast 0/0 switchport`

    B. `Switch#show vlan`

    C. `Switch#show vlans`

   **D.** `Switch#show trunks`

116. Which class is the IP address 172.23.23.2?

    A.   Class A

    B.   Class B

    C.   Class C

    D.   Class D

117. Which is the default subnet mask for a Class A address?

    A.   255.0.0.0

    B.   255.255.0.0

    C.   255.255.255.0

    D.   255.255.255.255

118. Which address is a multicast IP address?

    A.   221.22.20.2

    B.   223.3.40.2

    C.   238.20.80.4

    D.   240.34.22.12

119. Which is true of an IP address of 135.20.255.255?

    A.   It is a Class A address.

    B.   It is a broadcast address.

    C.   It is the default gateway address.

    D.   It has a default mask of 255.0.0.0

120. What is the CIDR notation for a subnet mask of 255.255.240.0?

    A.   /19

    B.   /20

    C.   /22

    D.   /28

121. You have been given an IP address network of 203.23.23.0. You are asked to subnet it for two hosts per network. What is the subnet mask you will need to use to maximize networks?

    A.   255.255.255.252

    B.   255.255.255.248

    C.   255.255.255.240

    D.   255.255.255.224

122. You have been given an IP address network of 213.43.53.0. You are asked to subnet it for 22 hosts per network. What is the subnet mask you will need to use to maximize networks?

    A. 255.255.255.252

    B. 255.255.255.248

    C. 255.255.255.240

    D. 255.255.255.224

123. Which valid IP is in the same network as 192.168.32.61/26?

    A. 192.168.32.59

    B. 192.168.32.63

    C. 192.168.32.64

    D. 192.168.32.72

124. You are setting up a network in which you need 15 routed networks. You have been given a network address of 153.20.0.0, and you need to maximize the number of hosts in each network. Which subnet mask will you use?

    A. 255.255.224.0

    B. 255.255.240.0

    C. 255.255.248.0

    D. 255.255.252.0

125. An ISP gives you an IP address of 209.183.160.45/30 to configure your end of the serial connection. Which IP address will be on the side at the ISP?

    A. 209.183.160.43/30

    B. 209.183.160.44/30

    C. 209.183.160.46/30

    D. 209.183.160.47/30

126. In the following exhibit, what needs to be changed for Computer A to successfully communicate with Computer B (assume the least amount of effort to fix the problem)?

192.168.1.46/26   192.168.1.63/26   192.168.1.129/26

A

B

192.168.1.180/26
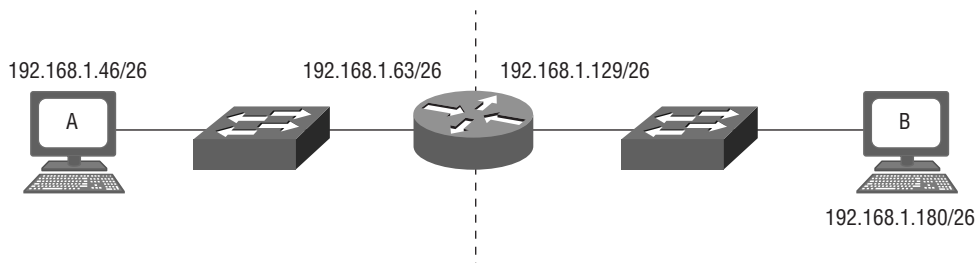
A. Computer A needs to have its IP address changed.

B. Computer B needs to have its IP address changed.

C. The default gateway IP address for Computer A needs to be changed.

D. The default gateway IP address for Computer B needs to be changed.

127. In the following exhibit, what needs to be changed for Computer A to successfully communicate with Computer B (assume the least amount of effort to fix the problem)?

192.168.1.33/27   192.168.1.30/27   192.168.1.66/27

A   B

192.168.1.67/27
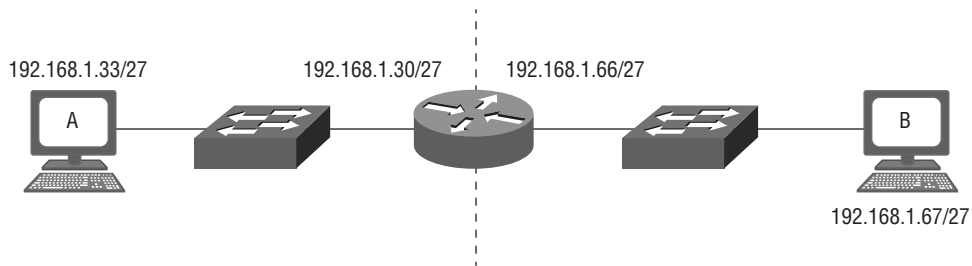
A. Computer A needs to have its IP address changed.

B. Computer B needs to have its IP address changed.

C. The default gateway IP address for Computer A needs to be changed.

D. The default gateway IP address for Computer B needs to be changed.

128. Which subnet does host 131.50.39.23/21 belong to?

A. 131.50.39.0/21

B. 131.50.32.0/21

C. 131.50.16.0/21

D. 131.50.8.0/21

129. A computer has an IP address of 145.50.23.1/22. What is the broadcast address for that computer?

A. 145.50.254.255

B. 145.50.255.255

C. 145.50.22.255

D. 145.50.23.255

130. What is the valid IP address range for the network of 132.59.34.0/23?

A. 132.59.34.1 to 132.59.36.254

B. 132.59.34.1 to 132.59.35.254

C. 132.59.34.1 to 132.59.34.254

D. 132.59.34.1 to 132.59.35.255

131. What is the subnet mask for a CIDR notation of /20?

    A. 255.255.224.0

    B. 255.255.240.0

    C. 255.255.248.0

    D. 225.225.252.0

132. What is the number of subnets which you can have for a mask of 255.255.255.248?

    A. 8

    B. 16

    C. 32

    D. 64

133. What is the valid number of hosts for a network with a subnet mask of 255.255.255.224?

    A. 16

    B. 32

    C. 14

    D. 30

134. You have been given the network of 141.23.64.0/19. What is a valid host in this network?

    A. 141.23.120.5/19

    B. 141.23.96.12/19

    C. 141.23.97.45/19

    D. 141.23.90.255/19

135. You have four networks of 141.24.4.0, 141.24.5.0, 141.24.6.0, and 141.24.7.0 that you need to super-net together so you can write one ACL in your firewall. What is the super-netted address you will use?

    A. 141.24.4.0/20

    B. 141.24.4.0/21

    C. 141.24.4.0/22

    D. 141.24.4.0/23

136. You have eight consecutive networks of 132.22.24.0 to 123.22.31.0, which you need to super-net together so you can write one ACL in your firewall. What is the super-netted address you will use?

    A. 132.22.24.0/20

    B. 132.22.24.0/21

    C. 132.22.24.0/22

    D. 132.22.24.0/23

137. You need to use the IP address space of 198.33.20.0/24 and create a VLSM subnet scheme for the network in the following exhibit. What is the network ID for Subnet A?
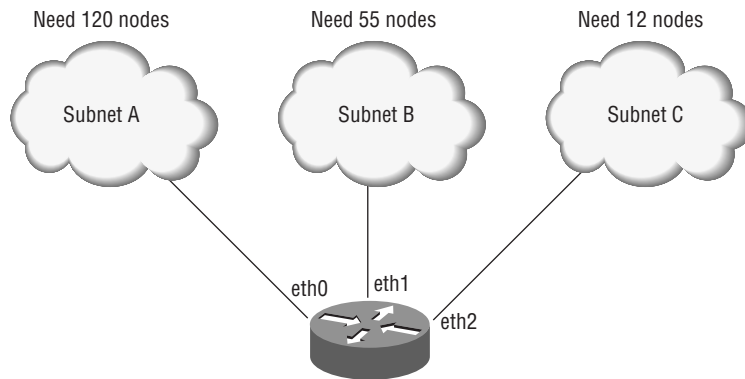
- **A.** 198.33.20.0/25
- **B.** 198.33.20.0/24
- **C.** 198.33.20.0/26
- **D.** 198.33.20.0/28

138. You need to use the IP space of 198.33.20.0/24 and create a VLSM subnet scheme for the network in the following exhibit. What is the network ID for Subnet B?
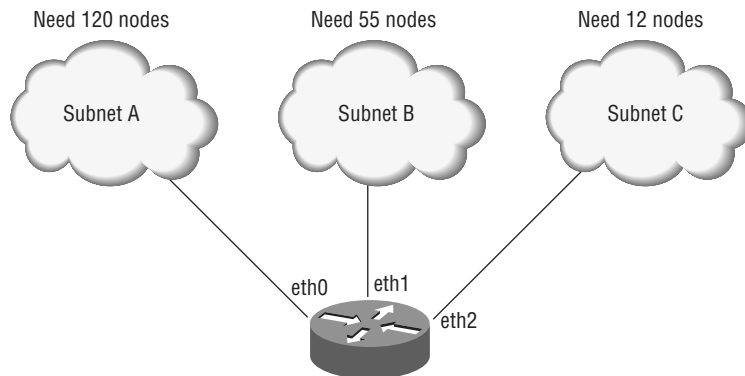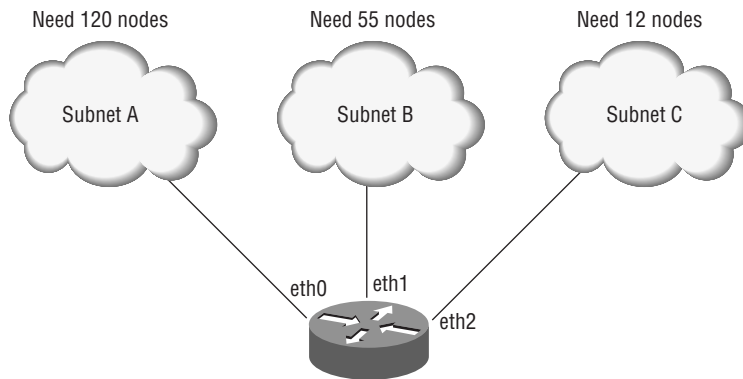

- **A.** 198.33.20.0/25
- **B.** 198.33.20.0/24
- **C.** 198.33.20.0/26
- **D.** 198.33.20.0/28

139. You need to use the IP space of 198.33.20.0/24 and create a VLSM subnet scheme for the network in the following exhibit. What is the network ID for Subnet C?

- **A.** 198.33.20.0/25
- **B.** 198.33.20.0/24
- **C.** 198.33.20.0/26
- **D.** 198.33.20.0/28

140. A computer with an IP address of 172.18.40.5/12 is having trouble getting to an internal server at an IP address of 172.31.2.4. The default gateway of the computer is 172.16.1.1. What is the problem?

- **A.** The IP address of the computer is wrong.
- **B.** The IP address of the default gateway is wrong.
- **C.** The IP address of the internal server is wrong.
- **D.** The problem is not the networking configuration.

141. A computer has an IP address of 192.168.1.6/24, and its gateway address is 192.168.1.1. It is trying to reach a server on an IP address of 127.20.34.4. The server is not responding. What is the problem?

- **A.** The IP address of the computer is wrong.
- **B.** The IP address of the default gateway is wrong.
- **C.** The IP address of the internal server is wrong.
- **D.** The problem is not the networking configuration.

142. Which is true about a layer 3 broadcast?

- **A.** All of the network bits are ones.
- **B.** The destination MAC in the frame is always all *F*s.
- **C.** The broadcast can be segmented by switches.
- **D.** The IP address is always 255.255.255.255.

143. Which method is used to direct communications to a single host?

   A. Unicast

   B. Broadcast

   C. Multicast

   D. Anycast

144. Which method is used to direct communications to the closest IP address to the source?

   A. Unicast

   B. Broadcast

   C. Multicast

   D. Anycast

145. Which method is used to direct communications to a group of computers that subscribe to the transmission?

   A. Unicast

   B. Broadcast

   C. Multicast

   D. Anycast

146. What is the multicast address range?

   A. 224.0.0.0/7

   B. 224.0.0.0/6

   C. 224.0.0.0/5

   D. 224.0.0.0/4

147. Which protocol allows multicast switches to join computers to the multicast group?

   A. ICMP

   B. IGMP

   C. IPMI

   D. IPGRP

148. Which protocol uses broadcasting at layer 3?

   A. ARP

   B. DHCP

   C. IGMP

   D. SNMP

149. Which method is used to direct communications to all computers in a subnet?

   A. Unicast

   B. Broadcast

   C. Multicast

   D. Anycast

150. Which of the following is an example of a multicast address?

    A. 192.168.1.224

    B. 240.23.4.224

    C. 239.45.32.1

    D. 244.23.43.11

151. Which RFC defines private IP addresses?

    A. RFC 1819

    B. RFC 1911

    C. RFC 1918

    D. RFC 3030

152. What is a major reason to use private IP addressing?

    A. It allows for the conservation of public IP addresses.

    B. Since they are non-routable on the Internet, they are secure.

    C. It keeps communications private.

    D. They allow easier setup than public IP addresses.

153. What is required when using private IP addresses to communicate with Internet hosts?

    A. Internet router

    B. IPv4 tunnel

    C. VPN tunnel

    D. Network Address Translation

154. Which is the Class A private IP address range?

    A. 10.0.0.0/8

    B. 10.0.0.0/12

    C. 172.16.0.0/12

    D. 10.0.0.0/10

155. Which is the Class B private IP address range?

    A. 10.0.0.0/8

    B. 10.0.0.0/12

    C. 172.16.0.0/12

    D. 10.0.0.0/10

156. Which is the Class C private IP address range?

    A. 192.168.1.0/24

    B. 192.168.0.0/24

    C. 192.168.0.0/16

    D. 192.168.0.0/12

157. You plug a laptop into a network jack. When you examine the IP address, you see 169.254.23.43. What can you conclude?

    A. The network jack is not working.

    B. Your laptop has a static IP address configured.

    C. The network is configured properly.

    D. The DHCP server is down.

158. You plug a laptop into a network jack. When you examine the IP address, you see 10.23.2.3. What can you conclude?

    A. The network jack is not working.

    B. Your laptop has a static IP address configured.

    C. The network is configured properly.

    D. The DHCP server is down.

159. You want to put a web server online for public use. Which IP address would you use?

    A. 192.168.34.34

    B. 172.31.54.3

    C. 10.55.33.32

    D. 198.168.55.45

160. Who is the governing body that distributes public IP address?

    A. IANA

    B. RFC

    C. IAB

    D. IETF

161. Why is IPv6 needed in the world today?

    A. It does not require NAT to operate.

    B. The IPv4 address space is exhausted.

    C. IPv4 is considered legacy, and IPv6 is the replacement.

    D. IPv6 does not require subnetting.

162. How many bits is an IPv6 address?

    A. 32 bits

    B. 64 bits

    C. 128 bits

    D. 256 bits

163. You have two facilities and both use IPv6 addressing internally. However, both facilities are connected to the Internet via IPv4. What is one recommended method you can use to communicate between the facilities over the Internet?

- **A.** Dedicated leased line
- **B.** Frame Relay
- **C.** Dual stack
- **D.** 6to4 tunnel

164. Which command is required on a router to support IPv6 static addressing?

- **A.** Router(config)#ipv6 address
- **B.** Router(config)#ipv6 routing
- **C.** Router(config)#ipv6 enable
- **D.** Router(config)#ipv6 unicast-routing

165. Which command would you use on an interface to set the IPv6 address?

- **A.** Router(config-if)#ip address 2001:0db8:85aa:0000:0000:8a2e:1343:1337
- **B.** Router(config-if)#ipv6 address 2001:0db8:85aa:0000:0000:8a2e:1343:1337
- **C.** Router(config-if)#ip address 2001:0db8:85aa:0000:0000:8a2e:1343:1337/64
- **D.** Router(config-if)#ipv6 address 2001:0db8:85aa:0000:0000:8a2e:1343:1337/64

166. Which field of the IPv6 header allows for a dual-stack host to decide which stack to process the packet in?

- **A.** Version field
- **B.** Flow label
- **C.** Source address
- **D.** Destination address

167. Which command would set the IPv6 default route for a router to interface s0/0?

- **A.** Router(config)#ip route 0.0.0.0/0 s0/0
- **B.** Router(config)#ipv6 route 0.0.0.0/0 s0/0
- **C.** Router(config)#ipv6 unicast-route ::0/0 s0/0
- **D.** Router(config)#ipv6 route ::0/0 s0/0

168. You want to see all of the interfaces on a router configured with IPv6. Which command would you use?

- **A.** Router#show ipv6 interfaces brief
- **B.** Router#show ip interfaces brief
- **C.** Router#show interfaces status
- **D.** Router#show ip addresses

169. Which dynamic routing protocol(s) can be used with IPv6?

    A. RIPng

    B. OSPFv3

    C. EIGRPv6

    D. All of the above

170. You need to see all routes in the routing table for only IPv6. Which command will achieve this?

    A. `Router#show route`

    B. `Router#show ip route`

    C. `Router#show ipv6 route`

    D. `Router#show route ipv6`

171. Which is a valid shortened IPv6 address for 2001:0db8:0000:0000:0000:8a2e:0000:1337?

    A. 2001:db8:0000::8a2e::1337

    B. 2001:db8:::8a2e:0000:1337

    C. 2001:db8::8a2e::1337

    D. 2001:db8::8a2e:0:1337

172. Which is the correct expanded IPv6 address of 2001::456:0:ada4?

    A. 2001:0000:0000:0456:0000:ada4

    B. 2001:0000:0000:0000:456:0000:ada4

    C. 2001:0000:0000:0000:0000:0456:0000:ada4

    D. 2001:0000:0000:0000:0456:0000:0000:ada4

173. In the IPv6 address of 2001.0db8:1234:0016:0023:8080:2345:88ab/64, what is the subnet quartet?

    A. 1234

    B. 0016

    C. 0023

    D. 8080

174. What is the network prefix for the IPv6 address of 2001.db8::8080:2345:88ab/64?

    A. 2001:db8::/64

    B. 2001:0db8:8080:2345/64

    C. 2001:0db8:0000:8080/64

    D. 2001:0db8:0000:2345/64

175. You need to verify connectivity to an IPv6 address of fc00:0000:0000:0000:0000:0000:0000:0004. Which command would you use?

  A. Router#ping fc00::4

  B. Router#ping fc::4

  C. Router#ping6 fc00::4

  D. Router#ping6 fc::4

176. Which address is a valid IPv6 host address?

  A. fe8::1

  B. 2001:db8::2435

  C. ff02::1

  D. ::1

177. Which statement is true of an IPv6 address?

  A. The first 48 bits is the subnet ID.

  B. All IPv6 addresses have a built-in loopback.

  C. A single interface can be assigned multiple IPv6 addresses.

  D. The IPv6 address plan allows for doubling the amount of IPv4 addresses.

178. You have been given an IPv6 prefix of 2001:0db8:aabb:5/52. How many subnets can you have from this address?

  A. 8,192

  B. 4,096

  C. 1,024

  D. 512

179. You work for an ISP. The American Registry for Internet Numbers (ARIN) has given you the 2001:0db8:8/34 IP address block. You need to figure out how many /48 blocks you can assign to your customers.

  A. 32,768

  B. 16,384

  C. 8,192

  D. 4,096

180. How many bits are contained in each field of an IPv6 address between the colons?

  A. 8 bits

  B. 32 bits

  C. 4 bits

  D. 16 bits

181. Which command would be used inside of an interface to configure SLAAC?

    A. Router(config-if)#enable slaac

    B. Router(config-if)#ipv6 address slaac

    C. Router(config-if)#ipv6 address dhcp

    D. Router(config-if)#ipv6 address autoconfig

182. Which address is used for RS (Router Solicitation) messages?

    A. ff00::2

    B. ff02::2

    C. ff00::1

    D. ff02::1

183. Which address is used for RA (Router Advertisement) messages?

    A. ff00:2

    B. ff02:2

    C. ff00:1

    D. ff02:1

184. What protocol/process in IPv6 replaces the IPv4 ARP process?

    A. NDP (NS/NA)

    B. DAD (NS/NA)

    C. SLAAC (RS/RA)

    D. ARPv6(NS/NA)

185. Which layer 3 protocol allows for NDP to process SLAAC?

    A. IGMP

    B. ICMP

    C. ICMPv6

    D. IGMPv6

186. What are stateless DHCPv6 servers used for?

    A. Configuring the default gateway

    B. Configuring the IPv6 address

    C. Configuring the IPv6 prefix length

    D. Configuring the DNS server address

187. Which command will configure an IPv6 DHCP relay agent for an interface?

    A. Router(config-if)#ipv6 helper 2001:db8:1234::1

    B. Router(config-if)#ipv6 dhcp helper 2001:db8:1234::1

    C. Router(config-if)#ipv6 dhcp 2001:db8:1234::1

    D. Router(config-if)#ipv6 dhcp relay destination 2001:db8:1234::1

188. Which mechanism in IPv6 allows for SLAAC to avoid duplicating an IPv6 address?

   A. NDP (NS/NA)

   B. DAD (NS/NA)

   C. SLAAC (RS/RA)

   D. ARPv6(NS/NA)

189. What is the process of stateful DHCPv6 for IPv6?

   A. Discover, Offer, Request, Acknowledge

   B. Solicit, Advertise, Request, Reply

   C. Neighbor Solicitation, Neighbor Advertisement

   D. Router Solicitation, Router Advertisement

190. When SLAAC is performed on an IPv6 host, which process happens first?

   A. A Router Solicitation message is sent from the client.

   B. A Router Advertisement message is sent from the router.

   C. A link-local address is auto-configured on the client.

   D. DAD is performed on the IPv6 address.

191. Which address is a global unicast address?

   A. fe80:db80:db01:ada0:1112::1

   B. 2005:acd:234:1132::43

   C. fd00:ac34:34b:8064:234a::7

   D. ff00:101:4ab0:3b3e::10

192. Which address is a link-local address?

   A. fe80:db80:db01:ada0:1112::1

   B. 2005:acd:234:1132::43

   C. fd00:ac34:34b:8064:234a::7

   D. ff00:101:4ab0:3b3e::10

193. For global unicast addresses, which part of the address is allotted by the RIR, or Regional Internet Registry?

   A. First 23 bits

   B. First 32 bits

   C. First 48 bits

   D. First 64 bits

194. Which address is a unique-local address?

   A. fe80:db80:db01:ada0:1112::1

   B. 2005:acd:234:1132::43

   C. fd00:ac34:34b:8064:234a::7

   D. ff00::10

195. Which address is a multicast address?

    A. fe80:db80:db01:ada0:1112::1

    B. 2005:acd:234:1132::43

    C. fd00:ac34:34b:8064:234a::7

    D. ff00::10

196. Which IPv6 address type is similar to IPv4 RFC 1918 addresses?

    A. Link-local addresses

    B. Global unicast addresses

    C. EUI-64 addresses

    D. Anycast addresses

197. Which command would configure a single anycast address on a router's interface?

    A. Router(config-if)#ip address 2001:db8:1:1:1::12/64

    B. Router(config-if)#ipv6 address 2001:db8:1:1:1::12/64 anycast

    C. Router(config-if)#ipv6 anycast address 2001:db8:1:1:1::12/128

    D. Router(config-if)#ipv6 address 2001:db8:1:1:1::12/128 anycast

198. You are using the EUI-64 method of allocating the host portion of the IPv6 addresses. The MAC address of the host is f423:5634:5623. Which is the correct IP address that will be calculated for a network ID of fd00:1:1::?

    A. fd00:0001:0001:0000:f623:56ff:fe34:5623/64

    B. fd00:0001:0001:0000:f423:56ff:fe34:5623/64

    C. fd00:0001:0001:0000:fffe:f623:5634:5623/64

    D. fd00:0001:0001:0000:f623:56ff:ff34:5623/64

199. Which address is a EUI-64 generated address?

    A. 2001:db8:33::f629:58fe:ff35:5893/64

    B. fd00:4:33::f680:45ca:ac3b:5a73/64

    C. 2001:db8:aa::f654:56ff:fe34:a633/64

    D. 2001:db8:17:fffe:f623::ff34:5623/64

200. Which command would use the MAC address for the host portion of the IPv6 address on a router interface?

    A. Router(config-if)#ip address eui-64 2001:db8:1234::/64

    B. Router(config-if)#ip address 2001:db8:1234::/64 mac-address

    C. Router(config-if)#ipv6 address 2001:db8:1234::/64 eui-64

    D. Router(config-if)#ipv6 address 2001:db8:1234::/64 mac

201. You are using the EUI-64 method of allocating the host portion of the IPv6 addresses. The MAC address of the host is e5ee:f556:2434. What is the correct IP address that will be calculated for a network ID of fd00:2:2::?

    A.   fd00:2:2::e9ee:f5ff:fe56:2434/64

    B.   fd00:2:2::fffe:e5ee:f556:2434/64

    C.   fd00:2:2::e7ee:f5ff:fe56:2434/64

    D.   fd00:2:2::e2ee:f5ff:fe56:2434/64

202. Which command would you use to find the joined multicast groups for an IPv6 interface?

    A.   Router#show ipv6 multicast

    B.   Router#show ipv6 interface gi 0/1

    C.   Router#show ipv6 routes

    D.   Router#show mutlicast

203. Which type of IPv6 addressing allows for a one-to-many address for IP services?

    A.   Multicast address

    B.   Anycast address

    C.   Unicast address

    D.   Localcast address

204. What type of address is ::1/128?

    A.   Multicast address

    B.   Anycast address

    C.   Unicast address

    D.   Loopback address

205. Which type of IPv6 addressing allows for a one-to-closest address for IP services?

    A.   Multicast address

    B.   Anycast address

    C.   Unicast address

    D.   Loopback address

206. Which type of automatic address assignment will not allow for EUI-64 addressing?

    A.   Static addressing

    B.   SLAAC addressing

    C.   Stateful DHCPv6 addressing

    D.   Stateless DHCPv6 addressing

207. Which type of address always uses the EUI-64 addressing mechanism?

   A. Link-local addresses

   B. Global unicast addresses

   C. SLAAC addresses

   D. Anycast addresses

208. You have been given an IPv6 address of 2030:3454:aabb::/64. What can you conclude?

   A. The IP address is a unique-local address.

   B. The IP has been given to you by the Regional Internet Registry.

   C. The IP has been given to you by the Internet service provider.

   D. The IP has been given to you by IANA.

209. You are using the EUI-64 method of allocating the host portion of the IPv6 addresses. The MAC address of the host is 401e:32e4:ff03. What is the correct IP address that will be calculated for a network ID of fd00:3:3::?

   A. fd00:3:3::fffe:421e:32e4:ff03/64

   B. fd00:3:3::421e:32ff:fee4:ff03/64

   C. fd00:3:3::401e:32ff:fee4:ff03/64

   D. fd00:3:3::421e:32ff:ffe4:ff03/64

210. Which is a valid unique-local address?

   A. fec0:1111:2e3c:eab3::5/64

   B. fe80:d2e1:e24:63::25/64

   C. fd00:1edc:bae:eea4::2478/64

   D. fc00:4fec:ecf2:343::e44/64