

Practice Exam Questions for: Nokia Interior Routing Protocols (exam number: 4A0-101)

The following questions will test your knowledge and prepare you for the Nokia Interior Routing Protocol exam. Compare your responses with the Answer Key at the end of the document.

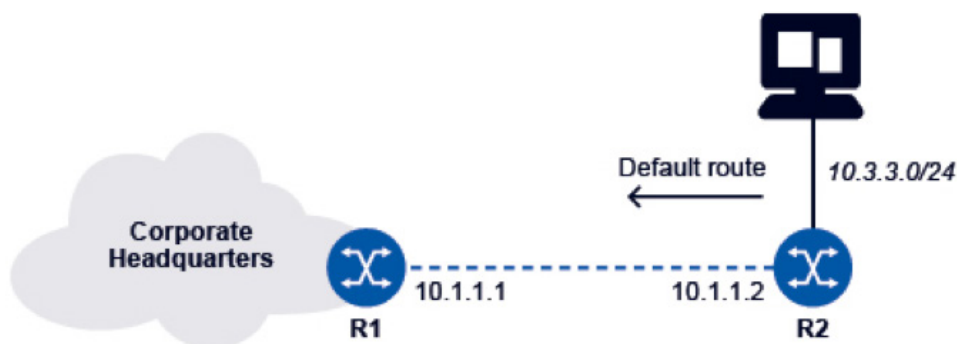
1. A router receives an IP packet and finds a matching entry for the destination IP address in the forwarding information base (FIB). Which elements of the FIB entry are required to forward the packet?
 - a. Only the egress interface is required.
 - b. Only the next-hop IP address is required.
 - c. Both the egress interface and the next-hop IP address are required.
 - d. Either the egress interface or the next-hop IP address is required.
2. What is the CIDR summary for the block of networks from 177.16.96.0/24 to 177.16.103.0/24?
 - a. 177.16.0.0/21
 - b. 177.16.96.0/21
 - c. 177.16.0.0/19
 - d. 177.16.96.0/19
3. Which of the following statements is FALSE when comparing IPv6 and IPv4 forwarding processes?
 - a. There is no header length field to process in IPv6 forwarding.
 - b. There is no fragmentation operation to perform in IPv6 forwarding.
 - c. The header checksum is verified and recalculated at each hop in both IPv4 and IPv6 forwarding.
 - d. Packets are forwarded hop-by-hop based on a lookup in the forwarding table in both IPv4 and IPv6 forwarding.
4. Which of the following is NOT a convention used for shortening IPv6 addresses?
 - a. Addresses are expressed in groups of four hex digits, separated by a single colon.
 - b. One or more groups of consecutive zeros can be replaced by two colons.
 - c. Only one instance of double colons can exist in the shortened address.
 - d. Leading zeros in a group must be kept in the shortened address.
5. On a Nokia 7750 SR, an IPv6-enabled router interface is bound to a port with MAC address 00:03:CA:14:88:AF. What is the IPv6 interface identifier value?
 - a. 0003:CAFF:FE14:88AF
 - b. 0003:CAFF:0014:88AF
 - c. 0203:CAFF:0014:88AF
 - d. 0203:CAFF:FE14:88AF

6. What is the destination address of the Neighbor Solicitation message sent by a router for resolving an IPv6 address to a MAC address?
 - a. The IPv6 address to resolve
 - b. The solicited-node multicast address
 - c. The link-local multicast address
 - d. The broadcast MAC address
7. Which of the following statements about an indirect static route is FALSE?
 - a. An indirect static route specifies that the static route is directly connected to a network configured on this router.
 - b. An indirect static route is only valid if the configured indirect address is a valid entry in the route table.
 - c. An indirect static route's indirect address must be resolved from a dynamic routing protocol.
 - d. An indirect static route imposes no overhead on the link or on the CPU of the router.
8. A static route is configured on router R1 to reach the PC at 139.120.121.2, as shown in the exhibit. What is the next-hop IP address of the configured route?



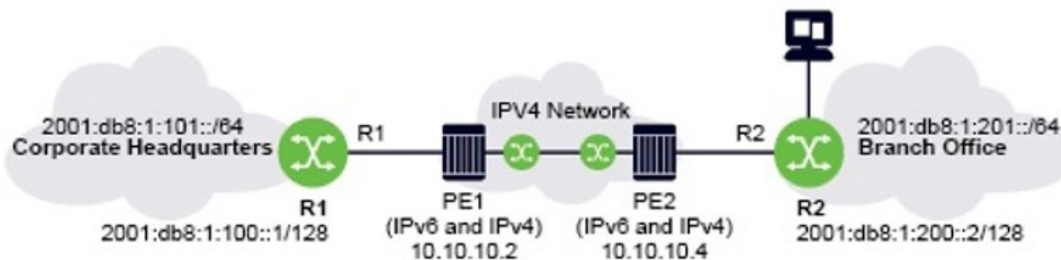
```
R1>config>router# static-route 139.120.121.0/24 next-hop ????
```

- a. 172.31.1.1
 - b. 172.31.1.2
 - c. 139.120.121.1
 - d. 139.120.121.2
9. What is the correct command to configure a default route on the Nokia 7750 SR R2?



- a. configure router default-route 0.0.0.0/0 next-hop 10.1.1.1
- b. configure router default-route 0.0.0.0/0 next-hop 10.1.1.2
- c. configure router static-route 0.0.0.0/0 next-hop 10.1.1.1
- d. configure router static-route 0.0.0.0/0 next-hop 10.1.1.2

10. Which of the following statements about 6over4 tunneling is TRUE?
- It enables network core routers to forward traffic based on IPv6 addresses.
 - It enables network core routers to carry IPv4 traffic.
 - It allows for passing IPv6 traffic through an IPv4 network.
 - It only runs IPv4 on the PE routers.
11. A service provider is deploying a 6over4 tunnel to connect a customer's branch office IPv6 network to the corporate headquarters as shown in the exhibit. What is the missing Next Hop address for the first destination prefix in PE1's route-table?

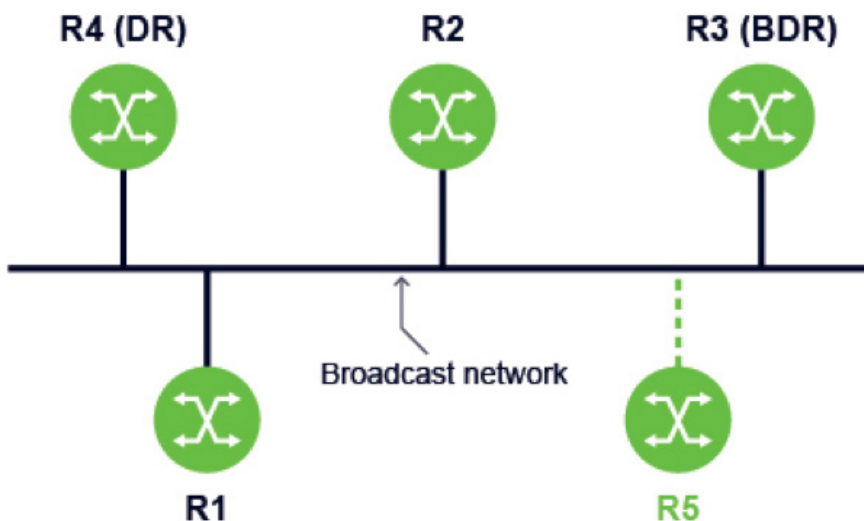


```
A:PE1# show router route-table ipv6
```

IPv6 Route Table (Router: Base)						
Dest Prefix[Flags]	Type	Proto	Age	Metric	Pref	
Next Hop[Interface Name]						
2001:db8:1:200::/56	Remote	Static	17h01m26s	5		
????			1			
2001:db8:1:100::/56	Remote	Static	16h54m09s	5		
fe80::216:4dff:fe13:5caf-"toR1"			1			
No. of Routes: 2						

- 2001:db8:1:200::2
 - fe80::216:4dff:fe13:5caf-"toR1"
 - 2001:db8:1:100::1
 - 10.10.10.4
12. A router R1 receives a link-state packet (LSP) with a sequence number higher than the one in its link-state database (LSDB). What actions does R1 perform?
- R1 discards the received LSP and sends an acknowledgment to the sending router.
 - R1 discards the received LSP and sends a more recent LSP to the sending router.
 - R1 adds the LSP information to its LSDB, forwards the LSP to its neighbors, and sends an acknowledgement to the sending router.
 - R1 adds the LSP information to its LSDB and forwards the LSP to its neighbors but does not send an acknowledgment to the sending router.
13. Which database is used by a link-state protocol to perform the SPF calculation that creates the SPF tree?
- Adjacency database
 - Link-state database
 - Forwarding database
 - Metric database

14. A router R1 receives an LSP with a sequence number higher than the one in its database. Which of the following actions is NOT performed by R1?
 - a. R1 updates its topological database.
 - b. R1 transmits an acknowledgement to the sender.
 - c. R1 increases the sequence number of the received LSP.
 - d. R1 floods the new LSP to its neighbors.
 - e. R1 runs the SPF algorithm against the new topological database.
15. Which of the following actions must be performed to enable OSPF on a Nokia 7750 SR?
 - a. Add the system interface to OSPF
 - b. Define one or more OSPF areas
 - c. Assign a cost to each interface
 - d. Configure a reference-bandwidth
16. Which of the following is not an OSPF packet type?
 - a. Hello
 - b. Database description
 - c. Link-state advertisement
 - d. Link-state acknowledgment
 - e. Link-state update
17. A router receives a link-state request packet from its neighbor and sends back a link-state update (LSU) packet. Which of the following statements about the LSU packet is FALSE?
 - a. It contains a list of link-state advertisements.
 - b. It is used by the neighbor router to update its link-state database.
 - c. It is flooded by the neighbor to its adjacent routers.
 - d. It is acknowledged with a link-state acknowledgment packet.
18. Routers R4 and R3 are the DR and BDR for the OSPF broadcast network when router R5 is added. Which router(s) will receive the LSAs advertised by router R5?



- a. R3 only
- b. R4 only
- c. Both R3 and R4
- d. All routers on the broadcast network

19. When does the state of an OSPF adjacency change from 'loading' to 'full' on a router?
 - a. When the router receives a hello packet from its neighbor that contains its own router ID in the neighbor list.
 - b. When the router receives a database description packet from its neighbor.
 - c. When the router sends a link-state request packet to its neighbor, asking for explicit information.
 - d. When the router receives all link-state updates from its neighbor, and acknowledges them.
20. What is the OSPF adjacency state right after the exchange of OSPF packets shown in the exhibit?

```

OSPF Version      : 2
Router Id         : 4.4.4.4
Area Id           : 0.0.0.0
Checksum          : e98c
Authentication    : Null
Authentication Key: 00 00 00 00 00 00 00 00
Packet Type       : HELLO
Packet Length     : 48

Network Mask      : 255.255.255.252
Hello Interval    : 10
Options           : 02
Rtr Priority       : 1
Dead Interval     : 40
Designated Router : 0.0.0.0
Backup Router     : 0.0.0.0
Neighbor-1        : 5.5.5.5
"
  
```

```

OSPF Version      : 2
Router Id         : 5.5.5.5
Area Id           : 0.0.0.0
Checksum          : e98c
Authentication    : Null
Authentication Key: 00 00 00 00 00 00 00 00
Packet Type       : HELLO
Packet Length     : 48

Network Mask      : 255.255.255.252
Hello Interval    : 10
Options           : 02
Rtr Priority       : 1
Dead Interval     : 40
Designated Router : 0.0.0.0
Backup Router     : 0.0.0.0
Neighbor-1        : 4.4.4.4
"
  
```

- a. Down
 - b. Initializing
 - c. 2-way
 - d. Full
21. Which of the following fields is not included in an OSPF Router LSA?
 - a. Network mask
 - b. Link-state ID
 - c. Type
 - d. Metric
 22. Which statement about the link entries included in an OSPF Router LSA is FALSE, assuming all routers are fully adjacent?
 - a. There is one stub entry for the system interface.
 - b. There is one stub entry for each point-to-point interface.
 - c. There is one stub entry for each broadcast interface.
 - d. There is one transit entry for each broadcast interface.
 23. Which of the following statements about an OSPF Type 2 Network LSA is FALSE?
 - a. It is originated by a DR that is fully adjacent to at least one other router in the broadcast network.
 - b. It is flooded only within the area that contains the broadcast network.
 - c. It includes a metric field.
 - d. It includes the DR in the list of advertised routers.

24. What is the address of the broadcast network advertised by the Network LSA shown in the exhibit?

```
A:rtr1# show router ospf database 10.10.2.2 detail

=====
Rtr Base OSPFv2 Instance 0 Link State Database (type: All) (detail)
=====
Network LSA for Area 0.0.0.0
-----
Area Id       : 0.0.0.0           Adv Router Id   : 10.10.10.2
Link State Id  : 10.10.2.2
LSA Type       : Network
Sequence No    : 0x80000026       Checksum        : 0x68a7
Age           : 124               Length          : 32
Options        : E
Network Mask   : 255.255.255.252  No of Adj Rtrs  : 2
Router Id (1)  : 10.10.10.1       Router Id (2)   : 10.10.10.2
=====
```

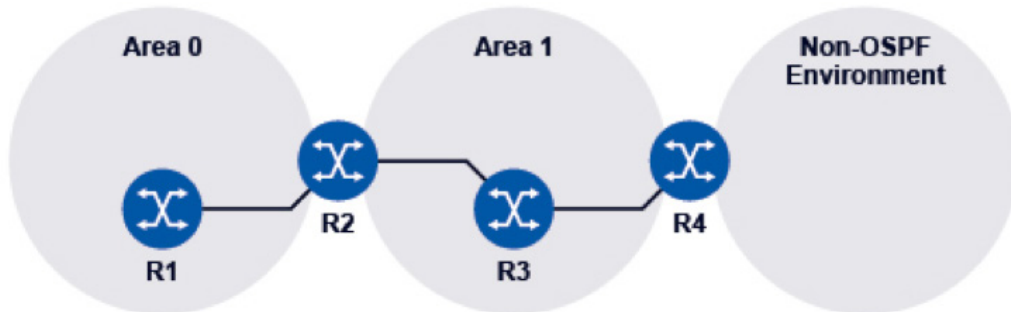
- a. 10.10.2.0/24
 - b. 10.10.2.0/30
 - c. 10.10.10.0/24
 - d. 10.10.10.0/30
 - e. There isn't enough information to determine the address of the broadcast network.
25. Based on the output shown in the exhibit, which IP address is distributed into OSPF by the ASBR?

```
R4# show router ospf database

=====
Rtr Base OSPFv2 Instance 0 Link State Database (type: All)
=====
Type      Area Id      Link State Id  Adv Rtr Id    Age  Sequence  Cksum
-----
Router    0.0.0.0          10.10.10.3     10.10.10.3    717  0x800000de 0xef21
Router    0.0.0.0          10.10.10.4     10.10.10.4    745  0x800000b4 0x79b5
Summary   0.0.0.0          10.10.10.2     10.10.10.3    913  0x800000d1 0xe81d
Summary   0.0.0.0          10.2.4.0       10.10.10.3    1408 0x80000034 0xe43f
AS Ext    n/a            10.10.10.1     10.10.10.2    729  0x80000001 0xeaeb
AS Summ   0.0.0.0          10.10.10.2     10.10.10.3    722  0x80000001 0x9cbb
=====
No. of LSAs: 6
=====
```

- a. 10.10.10.1
- b. 10.10.10.2
- c. 10.10.10.3
- d. 10.2.4.0

26. Router R4 is connected to a non-OSPF domain. Area 1 contains type 7 LSAs but does not contain any Summary LSAs. What type of area is area 1?



- a. Stub
 - b. Totally Stubby
 - c. NSSA
 - d. Totally NSSA
27. Based on the OSPF database output shown in the exhibit, what is the value of the missing Link State Id in the Type-4 LSA?

```
R2# show router ospf database
```

Rtr Base OSPFv2 Instance 0 Link State Database (type: All)						
Type	Area Id	Link State Id	Adv Rtr Id	Age	Sequence	Cksum
Router	0.0.0.0	10.10.10.1	10.10.10.1	717	0x800000de	0xef21
Router	0.0.0.0	10.10.10.2	10.10.10.2	745	0x800000b4	0x79b5
Summary	0.0.0.0	10.10.10.4	10.10.10.1	913	0x800000d1	0xe81d
Summary	0.0.0.0	10.4.2.0	10.10.10.1	1408	0x80000034	0xe43f
AS Ext	n/a	10.10.10.3	10.10.10.4	729	0x80000001	0xeaeb
AS Summ	0.0.0.0	????	10.10.10.1	722	0x80000001	0x9cbb
No. of LSAs: 6						

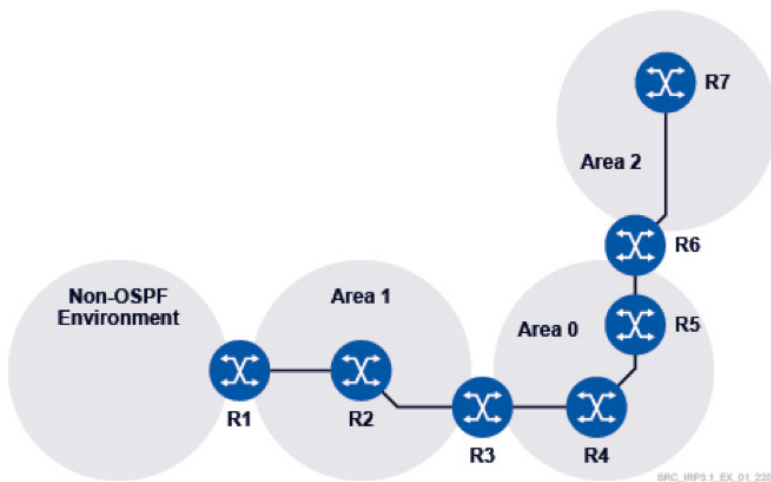
- a. 10.10.10.1
- b. 10.10.10.2
- c. 10.10.10.3
- d. 10.10.10.4

28. Routers R1 and R2 have their system interfaces added in OSPF. Route summarization is configured on router R2 as shown in the exhibit. How many Type-3 Summary LSAs exist in the OSPF database of router R3?



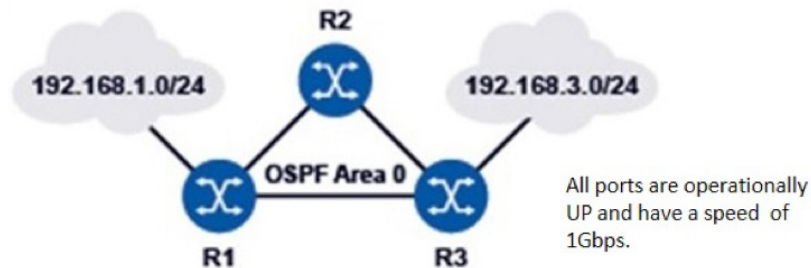
```
R2>config>router>ospf# info
-----
area 0.0.0.0
  interface "system"
    interface-type point-to-point
  exit
  interface "to-R3"
    interface-type point-to-point
  exit
exit
area 0.0.0.1
  area-range 172.10.0.0/16 advertise
  interface "to-R1"
    interface-type point-to-point
  exit
exit
-----
```

- a. 3
b. 4
c. 5
d. 6
29. In the topology shown in the exhibit, router R1 is an ASBR that exports external routes to OSPF. Assuming there are no stub networks, which of the following statements about Type 4 LSAs is TRUE?



- a. Router R2 has a Type 4 LSA in its OSPF database.
b. Router R5 receives a Type 4 LSA generated by router R6.
c. Router R6 has two Type 4 LSAs in its OSPF database.
d. Router R7 receives a Type 4 LSA generated by router R3.

30. Which of the following statements about an NSSA is FALSE?
- In an NSSA, the ASBR generates Type 7 LSAs.
 - Traffic can traverse an NSSA to access a non-OSPF part of the network.
 - The ABR connected to an NSSA converts Type 7 LSAs to Type 5 LSAs.
 - The ABR connected to an NSSA generates a Type 4 LSA.
31. In order for data traffic to flow from network 192.168.3.0/24 to network 192.168.1.0/24 through router R2, which of the following OSPF configurations should NOT be used on router R3?



R1>config>router>ospf>area# info

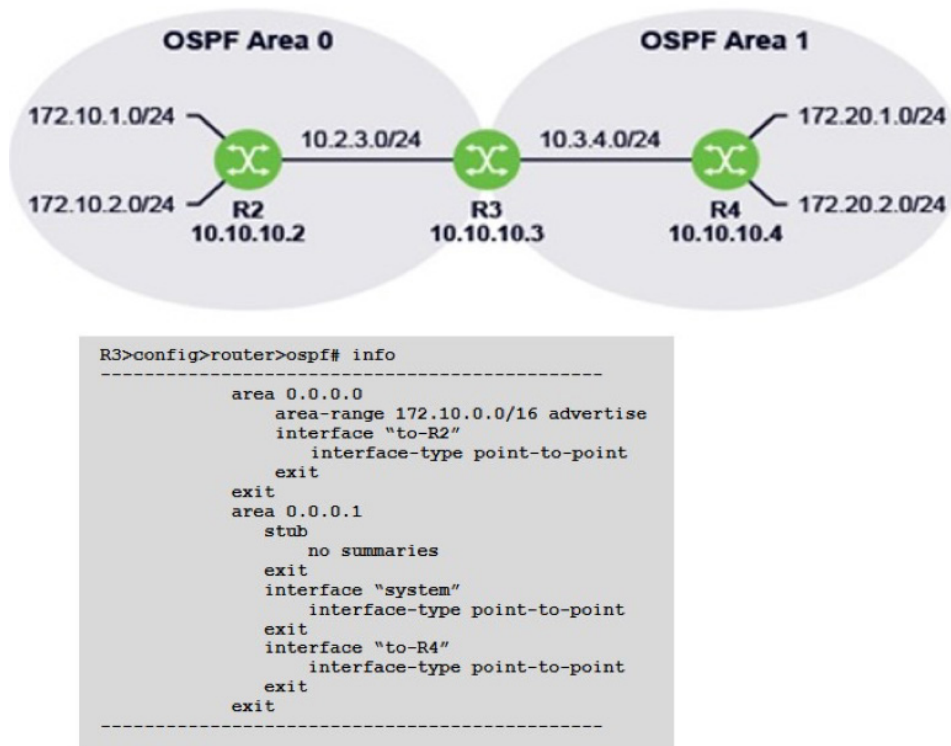
```
-----
interface "system"
  interface-type point-to-point
exit
interface "to-R2"
  interface-type point-to-point
exit
interface "to-R3"
  interface-type point-to-point
exit
interface "to-192.168.1.0"
exit
-----
```

R2>config>router>ospf>area# info

```
-----
interface "system"
  interface-type point-to-point
exit
interface "to-R1"
  interface-type point-to-point
exit
interface "to-R3"
  interface-type point-to-point
exit
-----
```

- Add all interfaces to OSPF, with the default metric on all interfaces.
- Add all interfaces except the interface to router R1 to OSPF, with the default metric on all interfaces.
- Add all interfaces to OSPF, and set the metric for the interface to router R1 to 3000.
- Add all interfaces to OSPF, and set the metric for the interface to router R1 to 300.

32. Which of the following is the expected contents of the OSPF database on router R3?



a.

```
R3# show router ospf database
```

Type	Area Id	Link State Id	Adv Rtr Id	Age	Sequence	Cksum
Router	0.0.0.0	10.10.10.2	10.10.10.2	176	0x800000dd	0xf718
Router	0.0.0.0	10.10.10.3	10.10.10.3	174	0x800000b1	0x85aa
Summary	0.0.0.0	10.10.10.4	10.10.10.3	176	0x80000001	0xb4a3
Summary	0.0.0.0	10.3.4.0	10.10.10.3	258	0x80000001	0x3a12
Summary	0.0.0.0	172.20.0.0	10.10.10.3	184	0x80000033	0xe63e
Router	0.0.0.1	10.10.10.3	10.10.10.3	179	0x8000000f	0xab69
Router	0.0.0.1	10.10.10.4	10.10.10.4	180	0x8000000c	0x8b65
Summary	0.0.0.1	0.0.0.0	10.10.10.3	97	0x80000001	0x57fe

No. of LSAs: 8

b.

```
R3# show router ospf database
```

Rtr Base OSPFv2 Instance 0 Link State Database (type: All)						
Type	Area Id	Link State Id	Adv Rtr Id	Age	Sequence	Cksum
Router	0.0.0.0	10.10.10.2	10.10.10.2	176	0x800000dd	0xf718
Router	0.0.0.0	10.10.10.3	10.10.10.3	174	0x800000b1	0x85aa
Summary	0.0.0.0	10.10.10.3	10.10.10.3	176	0x80000001	0xb4a3
Summary	0.0.0.0	10.10.10.4	10.10.10.3	123	0x80000001	0xe4a3
Summary	0.0.0.0	10.3.4.0	10.10.10.3	258	0x80000001	0x3a12
Summary	0.0.0.0	172.20.1.0	10.10.10.3	184	0x80000033	0xe63e
Summary	0.0.0.0	172.20.2.0	10.10.10.3	169	0x80000033	0xe47e
Router	0.0.0.1	10.10.10.3	10.10.10.3	179	0x8000000f	0xab69
Router	0.0.0.1	10.10.10.4	10.10.10.4	180	0x8000000c	0x8b65
Summary	0.0.0.1	0.0.0.0	10.10.10.3	97	0x80000001	0x57fe

No. of LSAs: 10

c.

```
R3# show router ospf database
```

Rtr Base OSPFv2 Instance 0 Link State Database (type: All)						
Type	Area Id	Link State Id	Adv Rtr Id	Age	Sequence	Cksum
Router	0.0.0.0	10.10.10.2	10.10.10.2	176	0x800000dd	0xf718
Router	0.0.0.0	10.10.10.3	10.10.10.3	174	0x800000b1	0x85aa
Summary	0.0.0.0	10.10.10.4	10.10.10.3	123	0x80000001	0xe4a3
Summary	0.0.0.0	10.3.4.0	10.10.10.3	258	0x80000001	0x3a12
Summary	0.0.0.0	172.20.1.0	10.10.10.3	184	0x80000033	0xe63e
Summary	0.0.0.0	172.20.2.0	10.10.10.3	169	0x80000033	0xe47e
Router	0.0.0.1	10.10.10.3	10.10.10.3	179	0x8000000f	0xab69
Router	0.0.0.1	10.10.10.4	10.10.10.4	180	0x8000000c	0x8b65
Summary	0.0.0.1	0.0.0.0	10.10.10.3	97	0x80000001	0x57fe

No. of LSAs: 9

d.

```
R3# show router ospf database
```

Rtr Base OSPFv2 Instance 0 Link State Database (type: All)						
Type	Area Id	Link State Id	Adv Rtr Id	Age	Sequence	Cksum
Router	0.0.0.0	10.10.10.2	10.10.10.2	176	0x800000dd	0xf718
Router	0.0.0.0	10.10.10.3	10.10.10.3	174	0x800000b1	0x85aa
Summary	0.0.0.0	10.10.10.3	10.10.10.3	176	0x80000001	0xb4a3
Summary	0.0.0.0	10.10.10.4	10.10.10.3	123	0x80000001	0xe4a3
Summary	0.0.0.0	10.3.4.0	10.10.10.3	258	0x80000001	0x3a12
Summary	0.0.0.0	172.20.1.0	10.10.10.3	184	0x80000033	0xe63e
Summary	0.0.0.0	172.20.2.0	10.10.10.3	169	0x80000033	0xe47e
Router	0.0.0.1	10.10.10.3	10.10.10.3	179	0x8000000f	0xab69
Router	0.0.0.1	10.10.10.4	10.10.10.4	180	0x8000000c	0x8b65
Summary	0.0.0.1	0.0.0.0	10.10.10.3	97	0x80000001	0x57fe
Summary	0.0.0.1	172.10.0.0	10.10.10.3	246	0x80000002	0xed3e

No. of LSAs: 11

33. Which of the following is NOT a possible solution to the ping problem from R1, to the system address of R3?



```

R2>config>router>ospf# info
-----
area 0.0.0.0
  interface "to-R3"
    interface-type point-to-point
  exit
exit
area 0.0.0.1
  nssa
    no summaries
  interface "to-R1"
    interface-type point-to-point
  exit
exit
-----

```

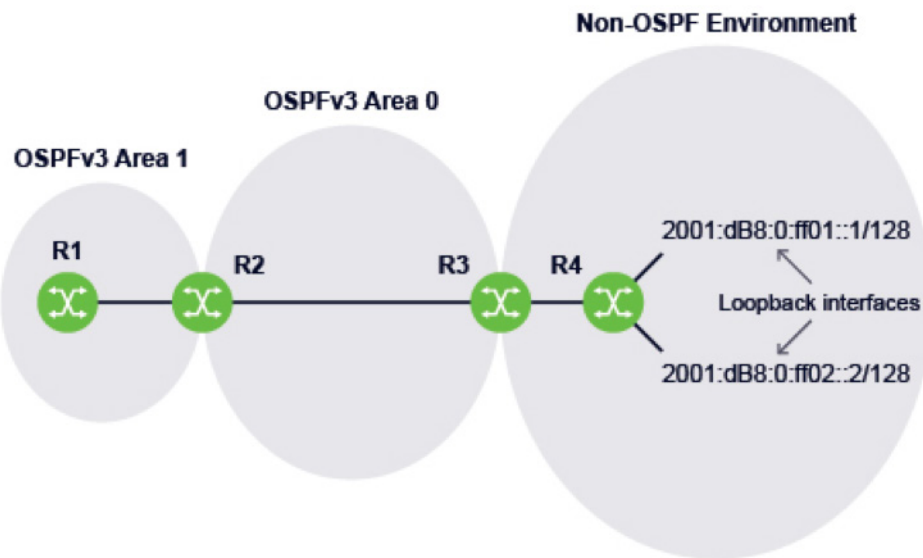
```

R1# ping 10.10.10.3 count 1
PING 10.10.10.3 56 data bytes
Request timed out. Icmp_seq=1.
---- 10.10.10.3 PING Statistics ----
1 packet transmitted, 0 packet received, 100% packet loss

```

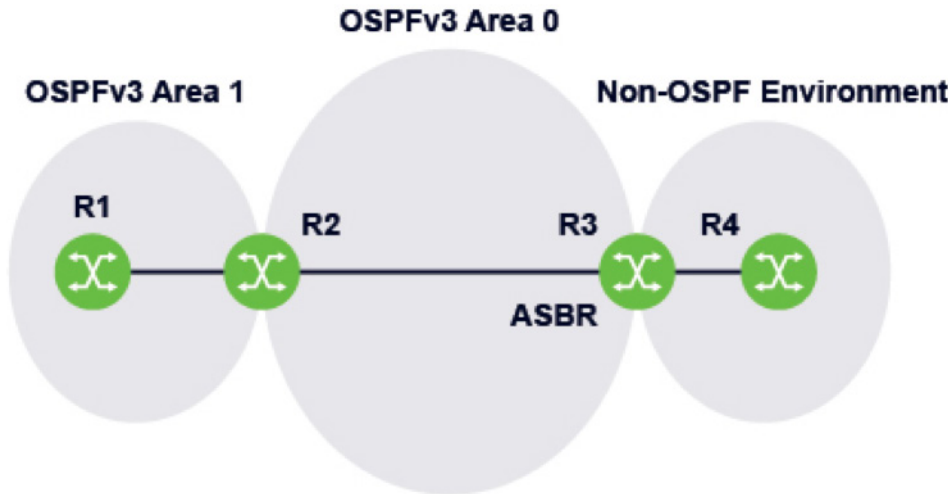
- a. Adding the "originate-default-route" option to nssa.
 - b. Including the system interface in area 0 configuration.
 - c. Adding a default route on router R3.
 - d. Removing the "no summaries" option from nssa.
34. Which of the following statements about OSPFv3 is FALSE?
- a. Network LSAs carry IPv6 prefix information.
 - b. There are three different flooding scopes.
 - c. OSPFv3 supports stub areas and NSSAs similar to OSPFv2.
 - d. Inter-Area Prefix LSAs are equivalent to OSPFv2 Type 3 Summary LSAs.
35. Which of the following link types is used in OSPFv2 Router LSAs, but is NOT used in OSPFv3 Router LSAs?
- a. Type 1 (point-to-point)
 - b. Type 2 (transit)
 - c. Type 3 (stub)
 - d. Type 4 (virtual)
36. Which of the following statements about Intra-Area Prefix (IAP) LSAs is TRUE?
- a. IAP LSAs carry protocol independent topology information.
 - b. Each router generates an IAP LSA to advertise its reachable destinations.
 - c. A designated router lists the routers on the broadcast network in an IAP LSA.
 - d. IAP LSAs are flooded throughout the entire OSPFv3 routing domain.

37. Which statement about Inter-Area Prefix (IEP) LSAs is FALSE?
- An IEP LSA is flooded by the ABR into a neighboring area.
 - Each IEP LSA contains information for only one prefix.
 - An IEP LSA has AS flooding scope.
 - Summarization helps to reduce the number of flooded IEP LSAs.
38. The route table on router R1 shows the loopback interfaces from the non-OSPF area. Which router is configured as ASBR, and what type of LSA does it generate to advertise the loopback interfaces?



- R2 and Inter-Area Prefix LSA
- R2 and AS External LSA
- R3 and Inter-Area Prefix LSA
- R3 and AS External LSA

39. Router R4 has a default static route to router R3 and can successfully ping the system address of router R1. Which of the following would cause the ping operation to fail?



- a. Configuring area 1 as a stub area.
 - b. Configuring area 1 as a stub area with 'no summaries' option.
 - c. Configuring area 1 as an NSSA.
 - d. Configuring area 1 as an NSSA with 'originate-default-route' option.
40. Which of the following statements about IS-IS and OSPF is FALSE?
- a. Both protocols trigger an update when there is a change in the link-state topology.
 - b. Both protocols support manual summarization.
 - c. Both protocols use IP to carry routing information messages.
 - d. Both protocols send Hello messages to multicast addresses during the discovery process.
41. Which of the following statements about Intermediate System (IS) Neighbors TLV in an IS-IS Hello packet is TRUE?
- a. It is only used in broadcast Hello packets.
 - b. It is only used in point-to-point Hello packets.
 - c. It contains information about the state of an adjacency.
 - d. It contains the router ID of the sending router.
42. Which of the following statements about the IS-IS complete sequence number PDU (CSNP) is FALSE?
- a. IS-IS routers exchange CSNPs to maintain link-state database consistency.
 - b. Only the designated IS (DIS) sends CSNPs on a broadcast link.
 - c. A router receiving a CSNP that references an older LSP transmits a copy of the LSP from its database to its neighbor.
 - d. A router receiving a CSNP that references a newer LSP sends a CSNP to its neighbor to request the LSP.
43. How does an IS-IS router acknowledge the receipt of an IS-IS LSP on a broadcast link?
- a. The router sends a PSNP to the sender.
 - b. The router sends an LSP to the sender.
 - c. The router sends a CSNP to the sender.
 - d. The periodic CSNPs sent by the DIS implicitly acknowledge the LSP.

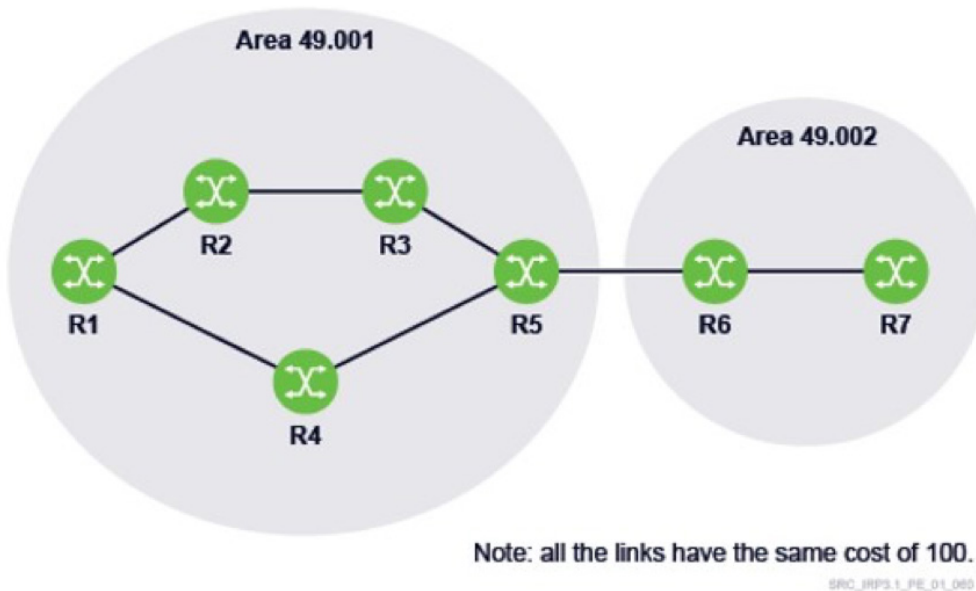
44. Which of the following statements about IS-IS adjacencies is FALSE?
- Two adjacent routers configured as Level 1 and Level 2 form two adjacencies if they have a common area ID.
 - On a point-to-point link, a single Hello is used for both Level 1 and Level 2 adjacencies.
 - An adjacency is only considered UP after the LSDBs of the two routers are synchronized.
 - Adjacent routers on a point-to-point link periodically exchange CSNPs to maintain database consistency.
45. On an IS-IS broadcast link between routers R1 and R2, both routers have a default interface priority of 64. Router R1 has a higher interface MAC address. The priority on router R2 is changed to 100. Which of the following is TRUE about the DIS before and after the change?
- Router R1 is the DIS and remains the DIS.
 - The DIS changes from router R1 to router R2.
 - Router R2 is the DIS and remains the DIS.
 - The DIS changes from router R2 to router R1.
46. Which of the following statements about the role of L1, L2, and L1/L2 routers in IS-IS is TRUE?
- An L1 router installs a default route to the nearest L1/L2 router in its own area.
 - An L1 router can form an adjacency with an L2 neighbor in its own area.
 - An L2 router only exchanges topology information with L2 routers.
 - An L1/L2 router advertises its L2 routes to other L1 routers in its own area.
47. The exhibit shows IS-IS output from routers R1 and R2. Which of the following is TRUE?

Router R1 ISIS Adjacency				
System ID	Usage	State	Hold	Interface
R2	L2	Up	20	toR2
R3	L1	Up	20	toR3
Adjacencies : 2				

Router R2 ISIS Adjacency				
System ID	Usage	State	Hold	Interface
R1	L2	Up	20	toR1
R4	L2	Up	20	toR4
Adjacencies : 2				

- Router R1 is an L1 router.
- Router R3 is an L1/L2 router.
- Routers R2 and R4 must be in the same area.
- Routers R1 and R3 must be in the same area.

48. The system addresses of all routers shown in the exhibit are included in IS-IS. Which of the following statements describes how router R1 reaches the system address of router R6?



```
R1# show router isis database level 1
=====
Router Base ISIS Database
=====
LSP ID                Sequence      Checksum      Lifetime      Attributes
-----
Displaying Level 1 database
-----
R1.00-00                0x8b        0xe3f5        753          L1
R2.00-00                0x88        0x3af8        769          L1L2
R4.00-00                0x8f        0x4c65        812          L1
R5.00-00                0x7e        0xdd36        721          L1L2
Level (1) LSP Count : 4
```

- Router R1 has a route to router R6's system address with router R4 as the next-hop.
 - Router R1 has a default route with router R2 as the next-hop.
 - Router R1 has a default route with router R4 as the next-hop.
 - Router R1 does not have a route to reach router R6's system address.
49. Which of the following statements about route summarization in IS-IS is FALSE?
- It reduces the number of routing updates flooded across the areas.
 - It reduces the size of link-state database on routers outside the area.
 - It provides more accurate routing information to routers outside the area.
 - It should be configured on an L1/L2 router that injects Level 1 routes into Level 2.

50. Routers R1 and R2 are connected with a 1 Gb/s link and have formed a Level 1 IS-IS adjacency. Based on the LSP shown in the exhibit, which of the following statements is TRUE?

```
R4# show router isis database R1.00-00 detail
=====
ISIS Database
=====
Displaying Level 1 database
-----
LSP ID    : R1.00-00                Level   : L1

... output omitted ...

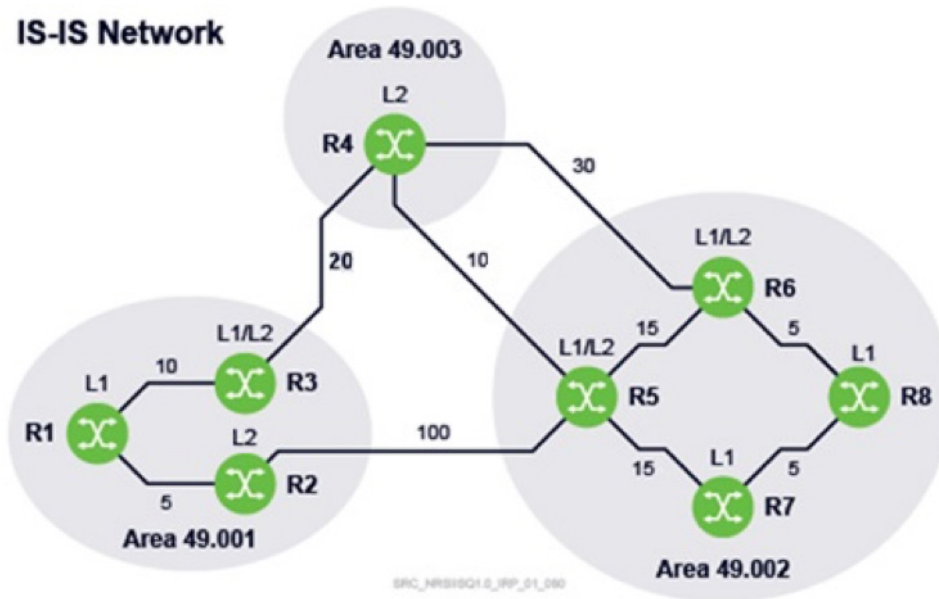
TLVs:
TE IP Reach    :
Default Metric : 0
Control Info:  , prefLen 32
Prefix       : 10.10.10.1
Default Metric : 63
Control Info:  , prefLen 27
Prefix       : 10.1.2.0

Level (2) LSP Count : 1
=====
```

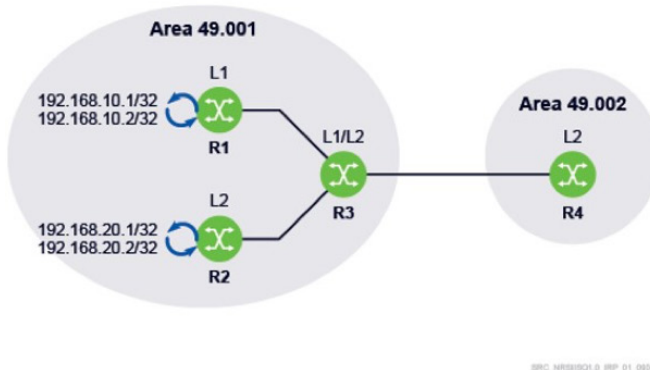
- Both reference-bandwidth and wide-metrics are configured on router R1.
- Reference-bandwidth is configured on router R1 but wide-metrics is not.
- Wide-metrics is configured on router R1 but reference-bandwidth is not.
- Neither reference-bandwidth nor wide-metrics is configured on router R1.

51. IS-IS link metrics are shown in the exhibit. What path does traffic follow from router R2 to router R7, and from router R7 to router R2?

IS-IS Network



- R2 to R7 follows R2-R1-R3-R4-R5-R7; R7 to R2 follows R7-R8-R6-R5-R4-R3-R1-R2.
 - R2 to R7 follows R2-R1-R3-R4-R5-R7; R7 to R2 follows R7-R8-R6-R4-R3-R1-R2.
 - R2 to R7 follows R2-R5-R7; R7 to R2 follows R7-R8-R6-R4-R3-R1-R2.
 - R2 to R7 follows R2-R5-R7; R7 to R2 follows R7-R5-R2.
52. Given the content of the L2 LSP originated by router R3, which of the following is TRUE?



```
R4# show router isis database R3.00-00 detail level 2
=====
ISIS Database
=====
Displaying Level 2 database
-----
LSP ID   : R3.00-00Level   : L2

... output omitted ...

TLVs:
TE IP Reach :
Default Metric : 0
Control Info: , prefLen 32
Prefix      : 10.10.10.3
Default Metric : 100
Control Info: , prefLen 30
Prefix      : 192.168.10.0
Default Metric : 100
Control Info: , prefLen 32
Prefix      : 192.168.20.1
Default Metric : 100
Control Info: , prefLen 32
Prefix      : 192.168.20.2

... output omitted ...

Level (2) LSP Count : 1
=====
```

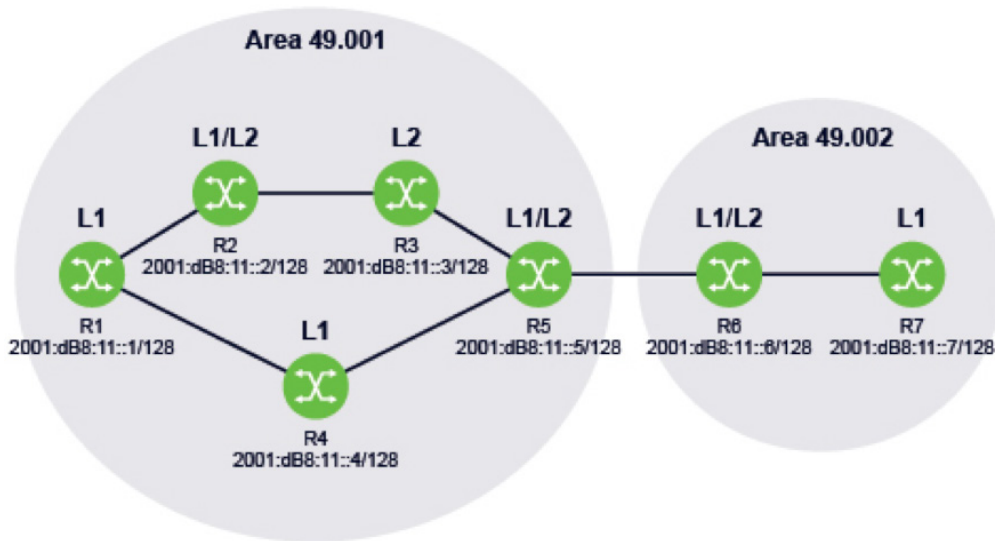
- Router R3 summarizes the loopback prefixes from router R1 as 192.168.10.0/30 and from router R2 as 192.168.20.0/30.
- Router R3 only summarizes the loopback prefixes from router R1 as 192.168.10.0/30.
- Router R3 only summarizes the loopback prefixes from router R2 as 192.168.20.0/30.
- Router R3 does not summarize any of the loopback prefixes from routers R1 and R2.

53. IS-IS adjacencies are established between the routers and each router exchanges its IPv4 and IPv6 system addresses with its neighbors. Which of the following statements about router R3 is TRUE?

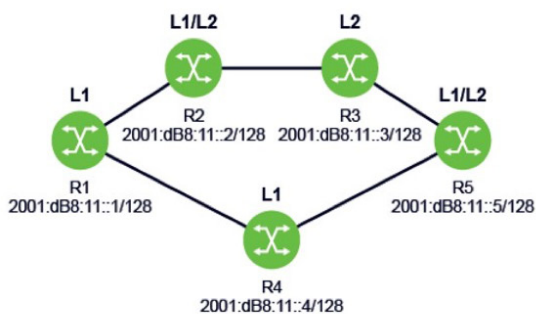


- a. It has three IS-IS adjacencies and three LSPs.
- b. It has three IS-IS adjacencies and four LSPs.
- c. It has three IS-IS adjacencies and five LSPs.
- d. It has four IS-IS adjacencies and four LSPs.
- e. It has four IS-IS adjacencies and five LSPs.
- f. It has four IS-IS adjacencies and six LSPs.

54. IS-IS IPv6 routing is configured in the network with globally routed addresses as shown in the exhibit. How many routes does router R1 have in its IPv6 route table?



- a. 4
b. 5
c. 6
d. 7
e. 12
f. 14
55. Based on the topology and the output shown in the exhibit, which of the following statements is TRUE?

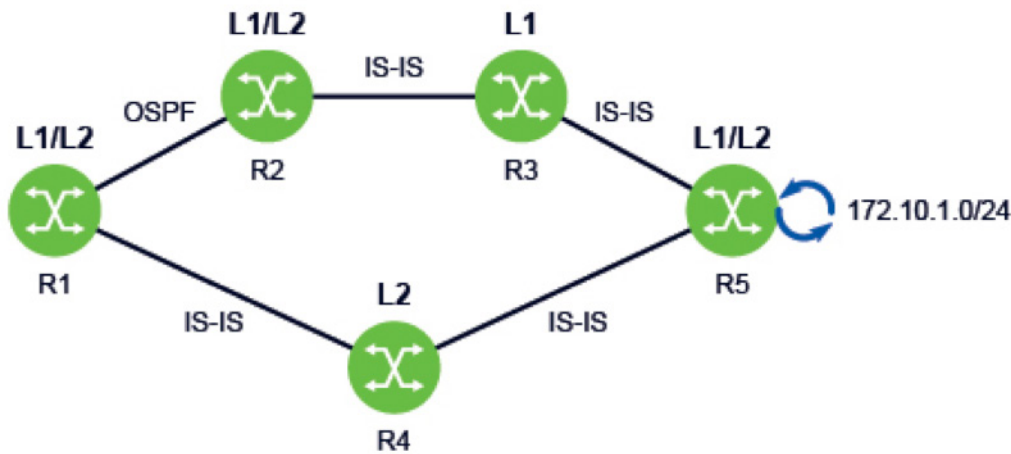


```
*A:R1# show router route-table ipv6
```

Dest Prefix[Flags]	Type	Proto	Age	Pref
Next Hop[Interface Name]			Metric	
::/0	Remote	ISIS	12h31m59s	15
FE80::203:FAFF:FE0E:9332-"toR2"			100	
2001:DB8::1/128	Local	Local	14h21m47s	0
system			0	
2001:DB8::2/128	Remote	ISIS	12h31m59s	15
FE80::203:FAFF:FE0E:9332-"toR2"			100	
2001:DB8::3/128	Remote	ISIS	12h30m19s	15
FE80::203:FAFF:FEAC:BB26-"toR4"			300	
2001:DB8::4/128	Remote	ISIS	12h26m07s	15
FE80::203:FAFF:FEAC:BB26-"toR4"			100	
2001:DB8::5/128	Remote	ISIS	12h30m19s	15
FE80::203:FAFF:FEAC:BB26-"toR4"			200	

- a. Route leaking is not configured on any router.
b. Route leaking is configured on router R2 but not on router R5.
c. Route leaking is configured on router R5 but not on router R2.
d. Route leaking is configured on both router R2 and router R5.

56. Which of the following statements about route redistribution on a Nokia 7750 SR is TRUE?
- Route redistribution determines which routes to accept into the route selection process.
 - OSPF routers that are redistributing routes must be configured as ABRs.
 - A route learned from an external source has a lower preference value than a route learned internally by the routing protocol.
 - A route received from an OSPF Type 1 LSA is preferred over the same route received from an IS-IS LSP with internal reachability.
57. If router R2 re-distributes the IS-IS route to 172.10.1.0/24 into OSPF, what will be the preference of the two routes received by router R1? Assume that all IS-IS routers are in the same area.



- OSPF internal preference and IS-IS Level 1 internal preference.
- OSPF internal preference and IS-IS Level 1 external preference.
- OSPF internal preference and IS-IS Level 2 internal preference.
- OSPF external preference and IS-IS Level 2 internal preference.
- OSPF external preference and IS-IS Level 2 external preference.
- OSPF external preference and IS-IS Level 1 external preference.

58. In the exhibit, the OSPF and IS-IS adjacencies are operationally up. Router R2 learns all four loopback addresses from IS-IS and has the displayed route policy configured. On router R3, how many of router R1's loopback prefixes are in the route table?

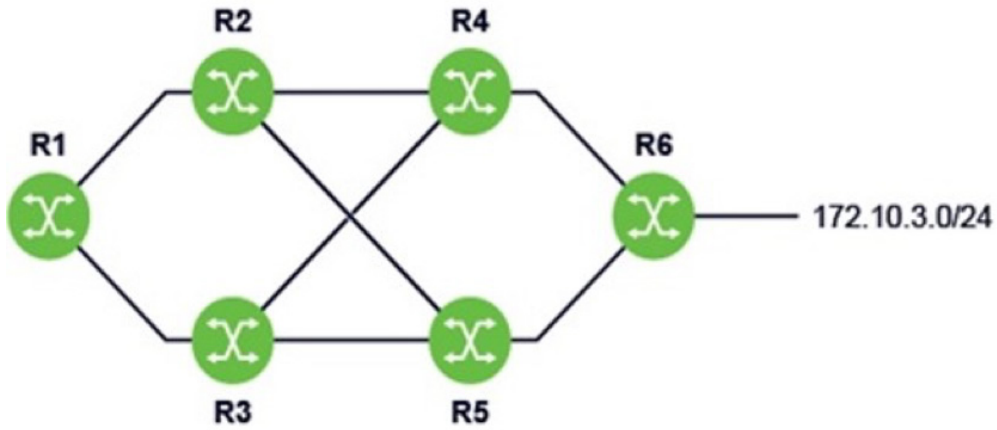


```
R2>config>router>policy-options# info
  prefix-list "redist"
    prefix 172.10.0.0/22 longer
  exit
  policy-statement "isis-to-ospf"
    entry 10
      from
        protocol isis
        prefix-list "redist"
      exit
      action accept
    exit
  exit
exit
```

```
R2>config>router>ospf# info
-----
  asbr
  export "isis-to-ospf"
  area 0.0.0.0
    interface "system"
      interface-type point-to-point
    exit
    interface "to-R3"
      interface-type point-to-point
    exit
  exit
```

- a. 0
 - b. 1
 - c. 2
 - d. 3
 - e. 4
59. Which of the following statements is TRUE about using an import policy to prevent learning the network 172.10.1.0/24 by router R1?
- a. Router R1 cannot discard the route if it uses OSPF or IS-IS because they do not support import policies.
 - b. Router R1 can discard the route using an import policy and a prefix list if it uses OSPF.
 - c. Router R1 can discard the route using an import policy and a prefix list if it uses IS-IS.
 - d. Router R1 can discard the route using an import policy and a prefix list if it uses either OSPF or IS-IS.

60. OSPF adjacencies are operational on all links shown in the exhibit and all routers are configured with an ECMP value of 3. How many entries does router R2's route table have for the destination prefix 172.10.3.0/24 advertised by router R6?



All links have the same cost.

- a. 1
- b. 2
- c. 3
- d. 4

Answer Key

1. C	16. C	31. A	46. A
2. B	17. C	32. B	47. D
3. C	18. C	33. B	48. B
4. D	19. D	34. A	49. C
5. D	20. C	35. C	50. B
6. B	21. A	36. B	51. A
7. A	22. C	37. C	52. B
8. B	23. C	38. D	53. C
9. C	24. B	39. C	54. B
10. C	25. A	40. C	55. C
11. D	26. D	41. A	56. D
12. C	27. D	42. D	57. D
13. B	28. A	43. D	58. D
14. C	29. C	44. C	59. A
15. B	30. D	45. B	60. B