Practice Exam Questions for: Nokia Border Gateway Protocol for Internet Routing (exam number: 4A0-102)

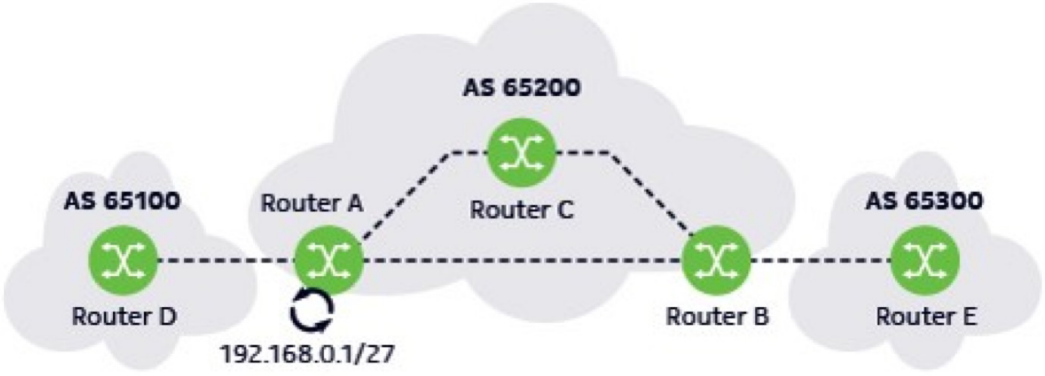
The following questions will test your knowledge and prepare you for the Nokia Border Gateway Protocol for Internet Routing exam. Compare your responses with the Answer Key at the end of the document.

1. From what range are 16-bit private AS numbers selected?
   a. 64496 – 64511
   b. 1 – 56319
   c. 64512 – 65534
   d. 64513 – 65535
   e. There are no defined private AS numbers; there are only private IP addresses.

2. Which of the following statements about the connections between eBGP peers is TRUE?
   a. eBGP peers typically use system addresses for session establishment.
   b. eBGP peers are managed under a single administration.
   c. eBGP peers do not propagate updates learned through iBGP.
   d. eBGP peers are usually directly connected to each other.

3. Which of the following statements is TRUE about the withdrawal of routes from one BGP speaker to another?
   a. An update message is used. Only a single prefix can be withdrawn at a time.
   b. An update message is used. Multiple prefixes can be withdrawn at a time.
   c. A withdraw message is used. Only a single prefix can be withdrawn at a time.
   d. A withdraw message is used. Multiple prefixes can be withdrawn at a time.

4. If router A originates an update for prefix 192.168.0.1/27, what will the update contain when it reaches router B?



   a. AS Path of 65200, local-preference of 100
   b. AS Path of 65200, local-preference of None
   c. Null AS Path, local-preference of 100
   d. Null AS Path, local-preference of None

5. Which of the following statements is TRUE about the TTL of a BGP message?
   a. TTL is a well-known mandatory BGP attribute.
   b. The default TTL value is 1 for an eBGP message, and 64 for an iBGP message.
   c. The default TTL value of an iBGP message can be modified using the “multihop” command.
   d. The default TTL value of an eBGP message can be modified using the “ttl-security” command.

6. What kind of attribute is the aggregator?
   a. Well-known mandatory
   b. Well-known discretionary
   c. Optional transitive
   d. Optional non-transitive

7. Which of the following statements regarding BGP route selection is TRUE?
   a. Lower local preference is preferred over higher local preference.
   b. Higher MED is preferred over lower MED.
   c. Higher origin code is preferred over lower origin code.
   d. Lower BGP router ID is preferred over higher BGP router ID.

8. A router receives two BGP routes. The first route is for 138.1.1.0/24 with an AS Path length of 3, Local Preference of 100, MED of 100, and router ID 10.10.10.10. The second route is for 138.1.0.0/16 with an AS Path length of 3, Local Preference of 100, MED of 100, and router ID 10.1.1.1. Assuming all other attributes are equal, which route would be used to forward an IP packet with destination IP address 138.1.1.1?
   a. The first BGP route.
   b. The second BGP route.
   c. Both routes are used.
   d. It is impossible to determine without the detailed AS Path.

9. Which of the following is NOT considered an option of import policies?
   a. Preventing unwanted NLRI from entering the AS.
   b. Filtering NLRI based on AS Path or prefix-lists.
   c. Modifying the local preference of route advertisements.
   d. Setting MED values of route advertisements.

10. A BGP router has loopback interfaces 192.168.1.1/27 and 192.168.2.1/27 advertised into BGP using the following export policy. The "aggregate 192.168.0.0/16" command is executed. What is the effect of this configuration?

```
[gl:configure policy-options policy-statement "Export_Loopbacks"]
  A:admin@R1# info
    entry 10 {
        from {
            protocol {
                name [direct]
            }
        }
        action {
            action-type accept
        }
    }
```

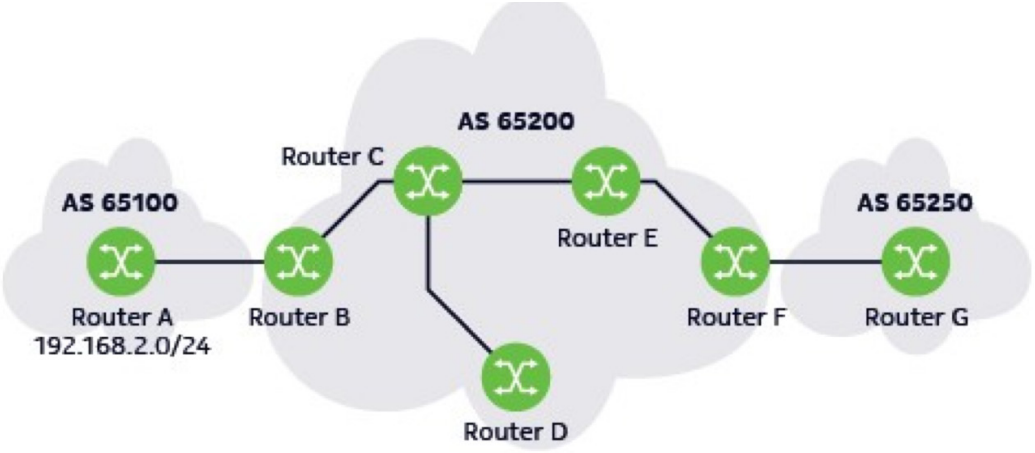
   a. A single route for 192.168.0.0/16 is advertised.
   b. BGP routes 192.168.1.0/27, 192.168.2.0/27 and 192.168.0.0/16 are advertised.
   c. BGP routes 192.168.1.0/27 and 192.168.2.0/27 are advertised, and 192.168.0.0/16 appears as a "Blackhole" route in the route table only.
   d. The given export policy is invalid.

11. Which of the following AS Paths will match the regular expression "<65100>"?
   a. "65100"
   b. "(65100)"
   c. "65100 65200"
   d. "(65100 65200)"

12. A Nokia 7750 SR receives a route from an eBGP peer without a MED. What MED value is sent to iBGP peers?
   a. 100
   b. 250
   c. The IGP cost
   d. None

13. Which of the following statements about route reflectors is TRUE?
   a. Route reflectors advertise BGP learned routes to their clients.
   b. Route reflectors require "n" iBGP sessions, where "n" is the number of BGP routers in the AS.
   c. Route reflectors disable iBGP split horizon for all iBGP peers in the AS.
   d. Route reflectors do not work in conjunction with confederations.

14. Routers C and E are route reflectors. When the update for prefix 192.168.2.0/24 is received on router C, what will be the Originator_ID attribute?

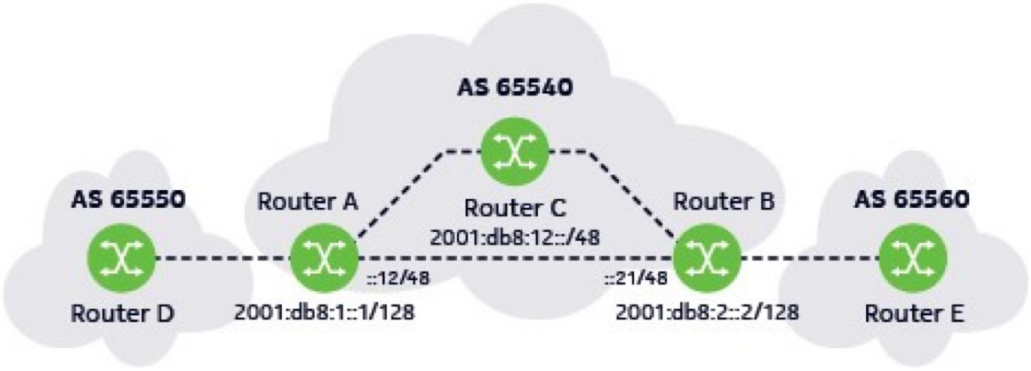


a. The router ID of router A.
b. The router ID of router B.
c. The router ID of router C.
d. It will not be set.

15. What class of attribute is Originator_ID?
a. Well-known mandatory
b. Well-known discretionary
c. Optional transitive
d. Optional non-transitive

16. Which of the following is TRUE regarding route reflectors?
a. Only the route reflector is configured with a cluster id.
b. There can only be one route reflector in a cluster.
c. Clients should have iBGP sessions with each other to maintain the mesh.
d. There can only be one level of route reflectors in the topology.

17. Assume all router IDs are properly configured. Which of the following configurations is required on the Nokia 7750 SR router A to establish an IPv6 iBGP session to router B?



a.

```
group "IPv6_iBGP" {
    next-hop-self true
    peer-as 65540
    family {
        ipv6 true
    }
}
neighbor "2001:db8:2::2" {
    group "IPv6_iBGP"
}
```

b.

```
group "IPv6_iBGP" {
    next-hop-self true
    type internal
    peer-as 65540
}
neighbor "2001:db8:2::2" {
    group "IPv6_iBGP"
}
```

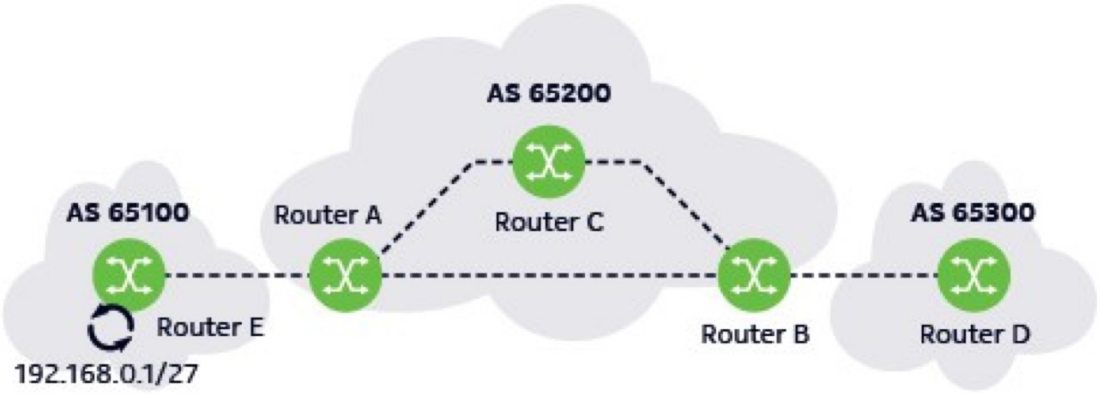
c.

```
group "IPv6_iBGP" {
    next-hop-self true
    type internal
    peer-as 65540
}
neighbor "2001:db8:12::21" {
    group "IPv6_iBGP"
}
```

d.

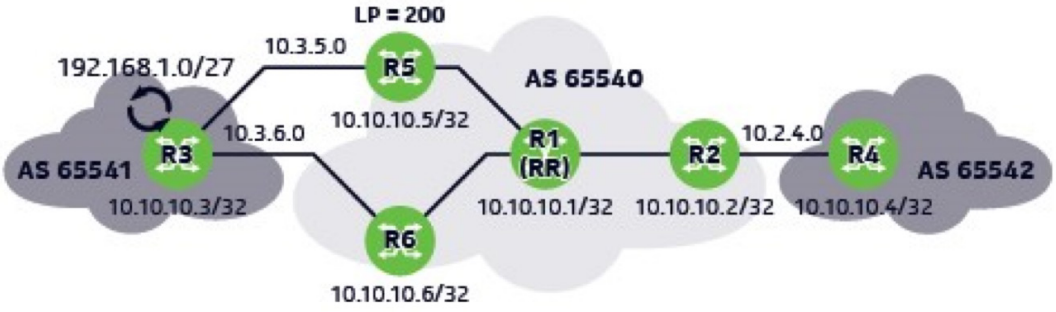
```
group "IPv6_iBGP" {
    next-hop-self true
    type internal
    family {
        ipv6 true
    }
}
neighbor "2001:db8:2::2" {
    group "IPv6_iBGP"
}
```

18. Assuming router A is configured with “next-hop-self”, what does the BGP update for prefix 192.168.0.1/27 contain when it arrives at router B?



a. AS Path of 65200 65100, Next Hop of router A.
b. AS Path of 65200 65100, Next Hop of router E.
c. AS Path of 65100, Next Hop of router A.
d. AS Path of 65100, Next Hop of router E.

19. Router R1 is a route reflector with clients R2, R5, and R6. Prefixes advertised by router R5 have a local preference of 200. Router R3 advertises the prefix 192.168.1.0/27 to routers R5 and R6. Assuming none of the routers in AS 65540 are configured with “advertise-external ipv4 true”, what is the expected output of “show router bgp routes” on router R5?



a.

```
Flag  Network                                          LocalPref   MED
      Nexthop (Router)                                 Path-Id     Label
      As-Path
-------------------------------------------------------------------------------
u*>i  192.168.1.0/27                                   200         None
      10.3.5.3                                         None        -
      65541
```

b.

```
Flag  Network                                          LocalPref   MED
      Nexthop (Router)                                 Path-Id     Label
      As-Path
-------------------------------------------------------------------------------
u*>i  192.168.1.0/27                                   None        None
      10.3.5.3                                         None        -
      65541
i     192.168.1.0/27                                   200         None
      10.10.10.5                                       None        -
      65541
i     192.168.1.0/27                                   100         None
      10.10.10.6                                       None        -
      65541
```

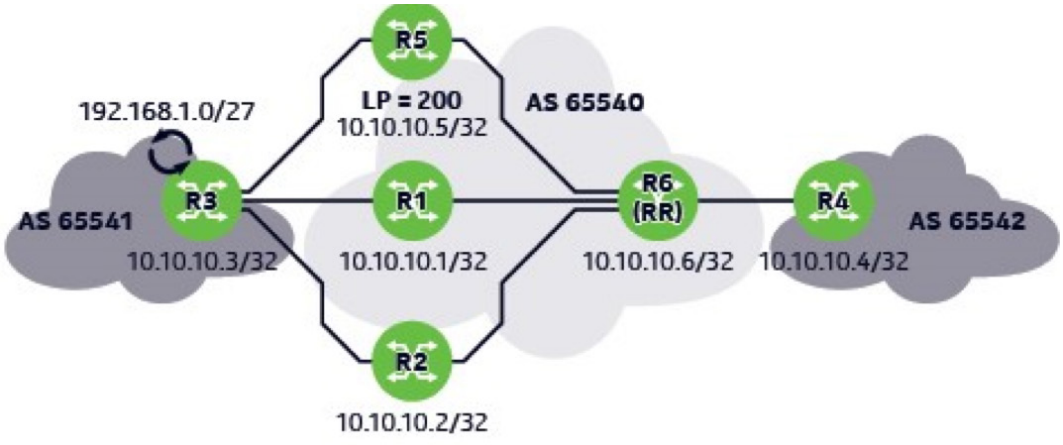
c.

```
Flag  Network                                          LocalPref   MED
      Nexthop (Router)                                 Path-Id     Label
      As-Path
------------------------------------------------------------------------------
u*>i  192.168.1.0/27                                   None        None
      10.3.5.3                                         None        -
      65541
i     192.168.1.0/27                                   200         None
      10.10.10.5                                       None        -
      65541
```

d.

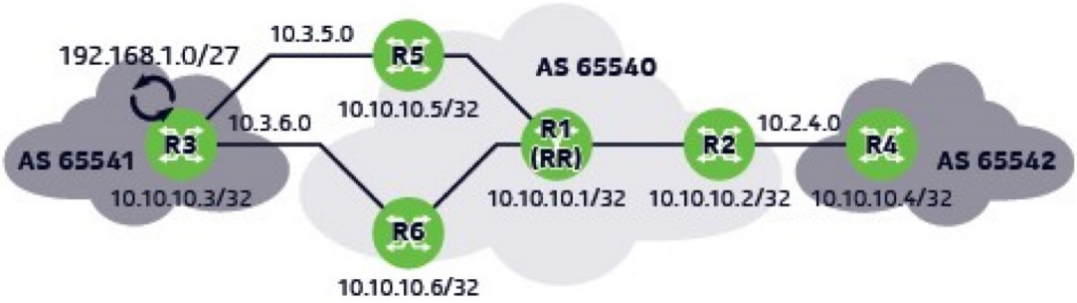
```
Flag  Network                                          LocalPref   MED
      Nexthop (Router)                                 Path-Id     Label
      As-Path
------------------------------------------------------------------------------
u*>i  192.168.1.0/27                                   200         None
      10.10.10.5                                       None        -
      65541
i     192.168.1.0/27                                   100         None
      10.10.0.6                                        None        -
      65541
```

20. Router R6 is a route reflector for clients R1, R2, and R5. Router R3 advertises prefix 192.168.1.0/27 to routers R1, R2, and R5. Router R5 is configured with a local preference of 200. On which router(s) is "advertise-external ipv4 true" needed for router R6 to receive three distinct routes for prefix 192.168.1.0/27?



a. On router R5.
b. On router R6.
c. On either router R1 or R2.
d. On routers R1 and R2.

21. Router R1 is a route reflector with clients R2, R5, and R6. Router R3 advertises the prefix 192.168.1.0/27 to routers R5 and R6. Assuming that routers R1, R2, and R4 are configured with “add-paths ipv4 send 2 receive true”, what is the expected output of “show router bgp routes” when executed on router R1?



a.

```
Flag  Network                                          LocalPref   MED
      Nexthop (Router)                                 Path-Id     Label
      As-Path
-------------------------------------------------------------------------------
u*>i  192.168.1.0/27                                   100         None
      10.10.10.5                                       1           -
      65541
*i    192.168.1.0/27                                   100         None
      10.10.10.6                                       2           -
      65541
```

b.

```
Flag  Network                                          LocalPref   MED
      Nexthop (Router)                                 Path-Id     Label
      As-Path
-------------------------------------------------------------------------------
u*>i  192.168.1.0/27                                   100         None
      10.10.10.5                                       None        -
      65541
*i    192.168.1.0/27                                   100         None
      10.10.10.6                                       None        -
      65541
```

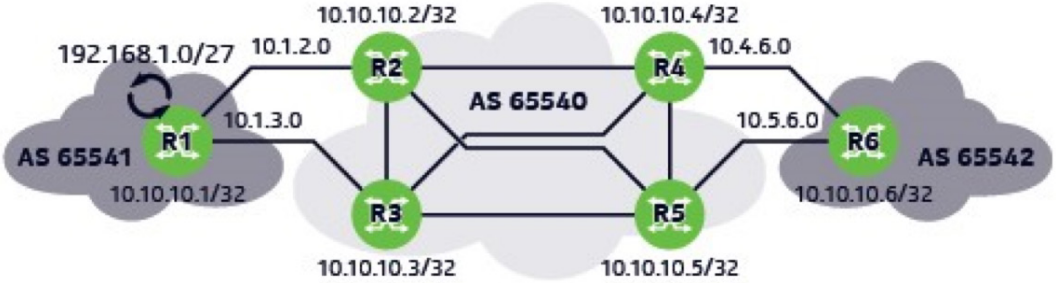
c.

```
Flag  Network                                          LocalPref   MED
      Nexthop (Router)                                 Path-Id     Label
      As-Path
-------------------------------------------------------------------------------
u*>i  192.168.1.0/27                                   100         None
      10.10.10.5                                       1           -
      65541
```

d.

```
Flag  Network                                          LocalPref   MED
      Nexthop (Router)                                 Path-Id     Label
      As-Path
-------------------------------------------------------------------------------
u*>i  192.168.1.0/27                                   100         None
      10.10.10.6                                       None        -
      65541
```

22. AS 65540 routers are iBGP fully meshed. Assume routers R4, R5, and R6 are configured with “add-paths ipv4 send 2 receive true”. Which routes to 192.168.0.1/27 is router R6 expected to have in its BGP routing table?

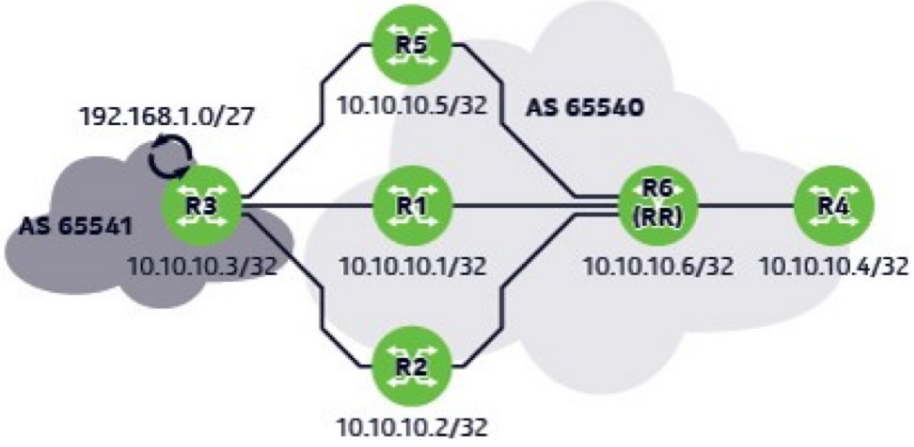


a. Two routes from router R4.
b. Two routes from router R5.
c. Two routes: one from router R4 and one from router R5.
d. Four routes: two from router R4 and two from router R5.

23. Which of the following routes is NOT considered an internal route?
a. A route received from a BGP peer within the same AS.
b. A route originated by a router in a different cluster of the same AS.
c. A route received from a BGP peer from a different member AS of a confederation.
d. A route received from a BGP peer from the same member AS of a confederation.

24. What kind of BGP attribute is the Multi_Exit_Disc?
    a. Optional transitive attribute
    b. Optional non-transitive attribute
    c. Well-known mandatory attribute
    d. Well-known discretionary attribute

25. Router R6 is a route reflector with clients R1, R2, R4, and R5. Add-paths is configured such that router R4 receives three routes for prefix 192.168.1.0/27. Backup path is enabled on router R4. Which of the following is the expected output for "show router bgp routes" when executed on router R4?



a.

```
Flag  Network                                          LocalPref   MED
      Nexthop (Router)                                  Path-Id     Label
      As-Path
-------------------------------------------------------------------------------
u*>i  192.168.1.0/27                                   100         None
      10.10.10.1                                       8           -
      65541
ub*i  192.168.1.0/27                                   100         None
      10.10.10.2                                       6           -
      65541
*i    192.168.1.0/27                                   100         None
      10.10.10.5                                       9           -
      65541
```

b.

```
Flag  Network                                          LocalPref   MED
      Nexthop (Router)                                  Path-Id     Label
      As-Path
-------------------------------------------------------------------------------
u*>i  192.168.1.0/27                                   100         None
      10.10.10.5                                       8           -
      65541
ub*i  192.168.1.0/27                                   100         None
      10.10.10.2                                       6           -
      65541
*i    192.168.1.0/27                                   100         None
      10.10.10.1                                       9           -
      65541
```

c.

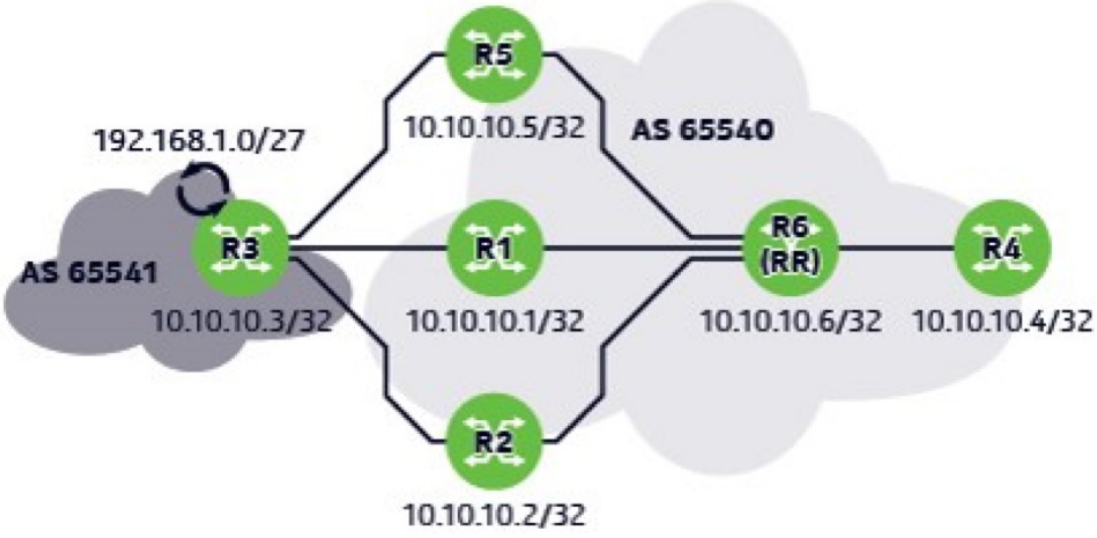
```
Flag  Network                                          LocalPref   MED
      Nexthop (Router)                                  Path-Id     Label
      As-Path
-------------------------------------------------------------------------------
u*>i  192.168.1.0/27                                   100         None
      10.10.10.2                                       8           -
      65541
ub*i  192.168.1.0/27                                   100         None
      10.10.10.5                                       6           -
      65541
```

d.

```
Flag  Network                                          LocalPref   MED
      Nexthop (Router)                                  Path-Id     Label
      As-Path
-------------------------------------------------------------------------------
u*>i  192.168.1.0/27                                   100         None
      10.10.10.1                                       8           -
      65541
u*>i  192.168.1.0/27                                   100         None
      10.10.10.2                                       6           -
      65541
```

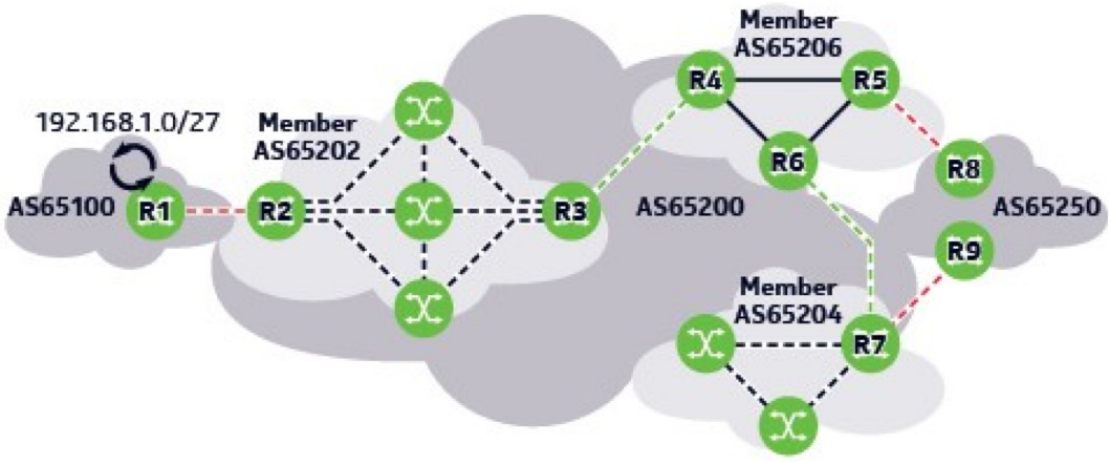
26. “Router R6 is a route reflector with clients R1, R2, R4, and R5. Router R4 receives three routes from router R6 and is configured with ECMP 3. Given the following BGP configuration on router R4, how many primary and backup paths will be present in router R4’s BGP routing table

```
[gl:/configure router "Base" bgp]
A:admin@R4# info
    backup-path {
        ipv4 true
    }
    add-paths {
        ipv4 {
            send 3
            receive true
        }
    }
    multipath {
        family ipv4 {
            ibgp 2
        }
    }
    group "iBGP" {
        peer-as 65540
        family {
            ipv4 true
        }
    }
       neighbor "10.10.10.6" {
        group "iBGP"
    }
```



a. Three primary paths
b. Two primary paths and one backup path
c. One primary path and two backup paths
d. One primary path and one backup path

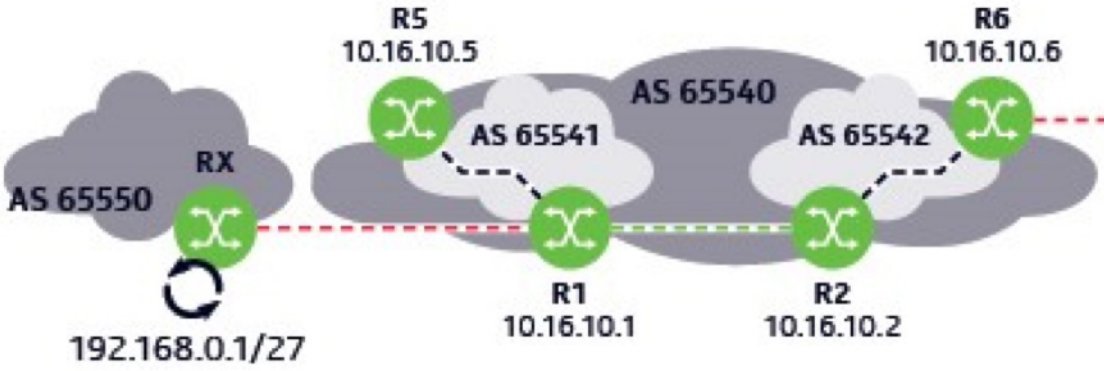
27. Which of the following statements best describes the BGP sessions within the given network?



a. The session between AS 65202 and AS 65206 is an iBGP session.
b. The session between AS 65204 and AS 65206 is an intra-confederation eBGP session.
c. A BGP session is required between AS 65202 and AS 65204.
d. The BGP sessions within the member ASs are known as inter-confederation BGP sessions.

28. Which of the following statements about BGP confederations is FALSE?
a. The entire confederation is viewed as a single AS by an eBGP peer.
b. Within a confederation, each member AS is considered as a stand-alone AS.
c. Member ASs within a confederation can use route reflection.
d. Member ASs must be fully meshed within a confederation.

29. Which of the following is a valid BGP configuration for router R2?



a.

```
[gl:/configure router "Base" bgp]
A:admin@R2# info
    group "Conf-eBGP" {
        peer-as 65541
        family {
            ipv4 true
        }
    }
    group "Member-AS" {
        peer-as 65542
        family {
            ipv4 true
        }
    }
       neighbor "10.16.10.1" {
        group "Conf-eBGP"
    }
       neighbor "10.16.10.6" {
        group "Member-AS"
    }
```

b.

```
[gl:/configure router "Base" bgp]
A:admin@R2# info
    group "Conf-eBGP" {
        peer-as 65541
        family {
            ipv4 true
        }
    }
    group "Member-AS" {
        peer-as 65540
        family {
            ipv4 true
        }
    }
       neighbor "10.16.10.1" {
        group "Conf-eBGP"
    }
       neighbor "10.16.10.6" {
        group "Member-AS"
    }
```

c.

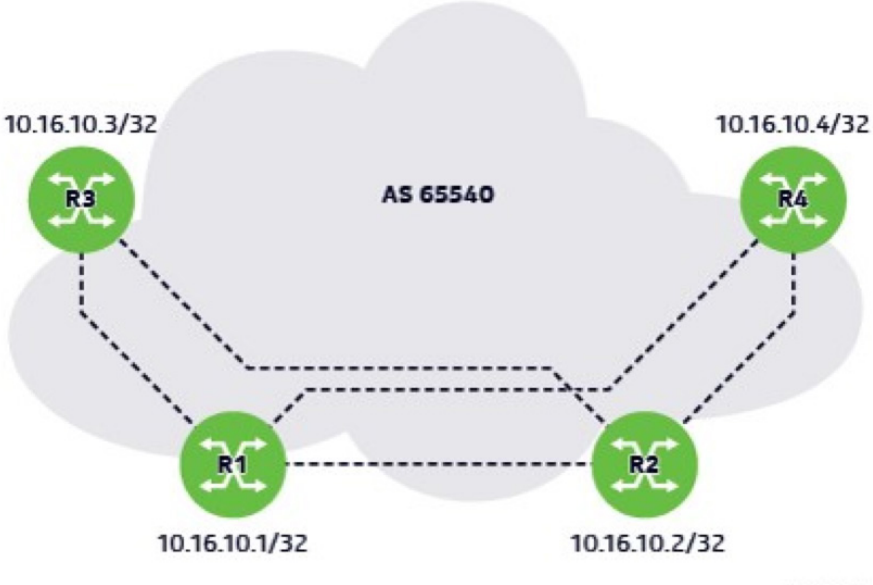
```
[gl:/configure router "Base" bgp]
A:admin@R2# info
    group "Conf-eBGP" {
        peer-as 65540
        family {
            ipv4 true
        }
    }
    group "Member-AS" {
        peer-as 65542
        family {
            ipv4 true
        }
    }
       neighbor "10.16.10.1" {
        group "Conf-eBGP"
    }
       neighbor "10.16.10.6" {
        group "Member-AS"
    }
```

d.

```
[gl:/configure router "Base" bgp]
A:admin@R2# info
    group "Conf-BGP" {
        peer-as 65540
        family {
            ipv4 true
        }
    }
       neighbor "10.16.10.1" {
        group "Conf-BGP"
    }
       neighbor "10.16.10.6" {
        group "Conf-BGP"
    }
```

30. “Given the following configuration of router R1, what can be said about the function of each of AS 65540’s routers?

```
 [gl:/configure router "Base" bgp]
A:admin@R1# info
    group "AS 65540 iBGP" {
        peer-as 65540
        family {
            ipv4 true
        }
    }
        neighbor "10.16.10.2" {
        group "AS 65540 iBGP"
    }
        neighbor "10.16.10.3" {
        group "AS 65540 iBGP"
            cluster {
            cluster-id 10.16.10.1
        }
    }
        neighbor "10.16.10.4" {
        group "AS 65540 iBGP"
            cluster {
            cluster-id 10.16.10.1
```



a. Routers R1 and R2 are redundant route reflectors with clients R3 and R4.
b. Routers R3 and R4 are route reflectors with clients R1 and R2.
c. Router R1 is a route reflector with clients R2, R3, and R4.
d. Router R1 is a route reflector with clients R3 and R4.

31. Which of the following is considered a best practice for BGP address planning?
    a. Advertising external networks into IGP.
    b. Using system addresses for setting up iBGP sessions.
    c. Exporting the networks associated with the external links of eBGP peers into BGP.
    d. Optimizing BGP route table by exporting IGP routes into BGP.

32. What is the result of configuring the following policy statement as a BGP import policy on the Nokia 7750 SR?

```
policy-statement "Policy-1" {
    entry 10 {
        from {
            prefix-list ["List-1" "List-2"]
            protocol {
                name [bgp]
            }
        }
        action {
            action-type accept
        }
    }
    default-action {
        action-type reject
    }
}
```

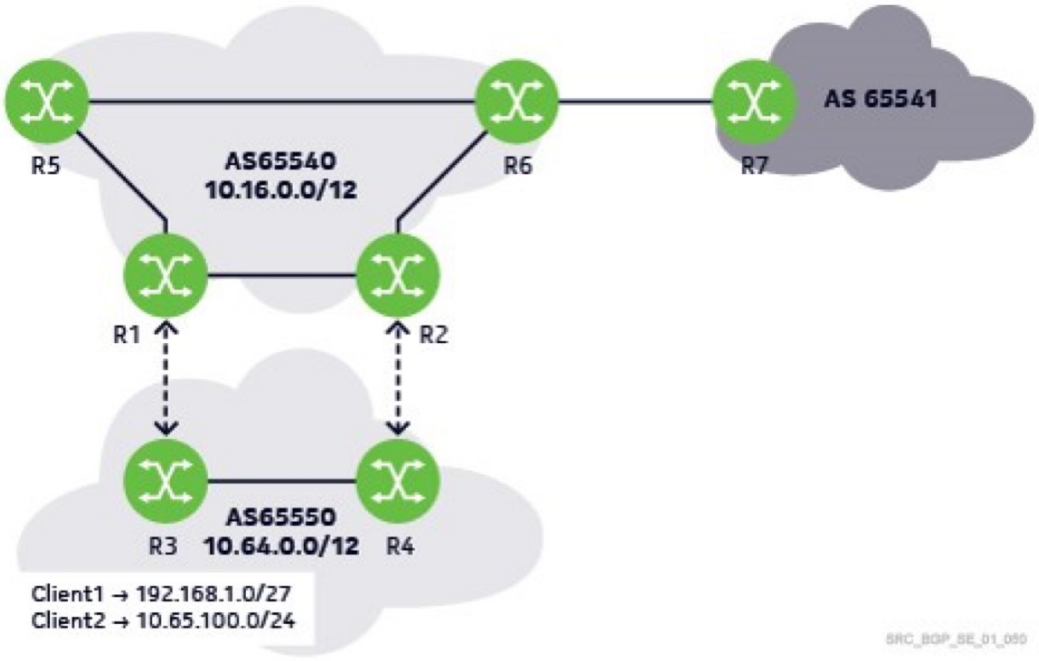
    a. All BGP routes are rejected.
    b. All routes matching prefix lists “List-1” and “List-2” are accepted.
    c. BGP routes matching prefix lists “List-1” or “List-2” are accepted.
    d. BGP routes matching prefix lists “List-1” and “List-2” are accepted.

33. “Assuming that “”client1”” and “”client2”” are directly connected networks, what is the result of executing the following BGP export policy?

```
entry 10 {
    from {
        protocol {
            name [direct]
        }
    }
    action {
        action-type accept
        community {
            add ["North"]
        }
    }
}
entry 20 {
    from {
        prefix-list ["client1"]
    }
    action {
        action-type accept
        community {
            add ["West"]
        }
    }
}
entry 30 {
    from {
        prefix-list ["client2"]
    }
    action {
        action-type accept
        community {
            add ["East"]
        }
    }
}
default-action {
    action-type reject
}
```

a. Only entry 10 is executed for “client1” and “client2.”
b. Entries 10 and 20 are executed for “client1,” and entries 10 and 30 are executed for “client2.”
c. Entries 10 and 20 are executed for “client1,” and entries 10, 20 and 30 are executed for “client2.”
d. Entry 10 is executed for directly connected routes, entry 20 for “client1” and entry 30 for “client2.”

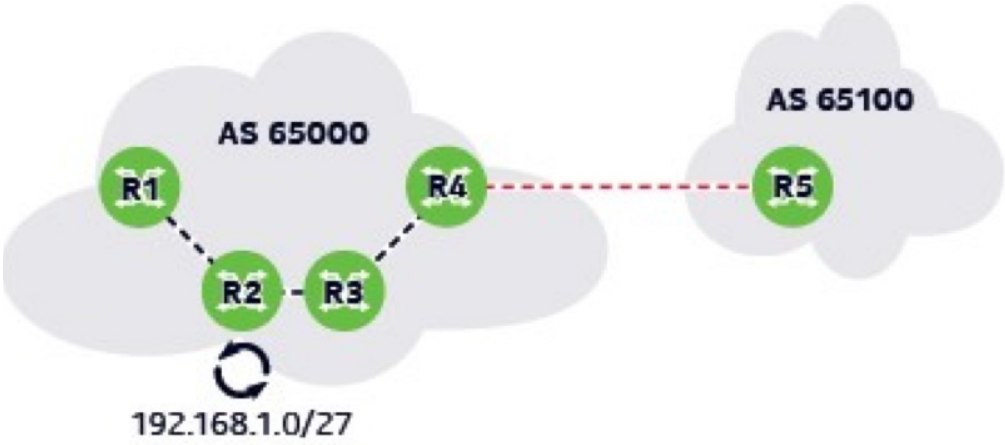
34. AS 65550 owns CIDR block 10.64.0.0/12. Router R3 advertises Client1 and Client2 networks into BGP. Router R6 creates an aggregate using the following configuration under router “Base” : “aggregates aggregate 10.64.0.0/12” and advertises it to AS 65541. Which of the following routes are received by router R7?



a. Client1, Client2, and the aggregate.
b. Only the aggregate.
c. Only Client1 and the aggregate.
d. Only Client2 and the aggregate.

35. A Nokia 7750 SR receives two updates for the same route with local preferences 200 and 300, respectively. What local preference is sent to eBGP peers?
a. 100
b. 200
c. 300
d. None

36. Router R2 is advertising prefix 192.168.1.0/27 with community “no-advertise”. Which routers receive an update for that prefix?



a. Router R1 and R3 only.
b. Routers R1, R3 and R4 only.
c. Routers R1, R3, R4, and R5 only.
d. Router R2 does not advertise an update for the prefix.

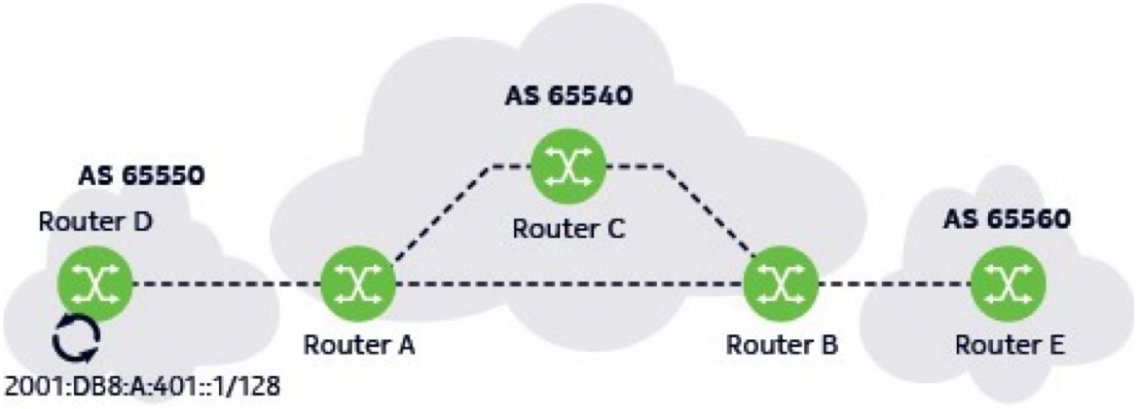
37. Which of the following is FALSE about the BGP databases?
a. Adj-RIBs-In stores all routes received from BGP neighbors.
b. The Loc-RIB stores the routes before the import policies process the routing information.
c. Adj-RIBs-Out stores only a subset of the paths placed in the Loc-RIB.
d. Only the best BGP routes are sent to the Loc-RIB.

38. Which of the following statements about BGP recursive lookup is FALSE?
a. A BGP recursive lookup is performed on the packet’s destination IP address.
b. Address matching is based on longest-match routing.
c. If the lookup returns an interface, the packet is encapsulated and forwarded via the specified interface.
d. A BGP recursive lookup is needed if the egress interface is not known.

39. Which of the following is FALSE about IPv6 BGP implementation on a Nokia 7750SR?
a. The router ID must be reachable.
b. The router must have a chassis-mode of “c” or higher.
c. Link-local addresses can be used for eBGP sessions.
d. A router ID must be 32 bits.

40. Assume all router IDs are properly configured, and IPv6 link-local addresses are used to establish all eBGP sessions. Given the following iBGP configuration on router A, what is the Next Hop for prefix 2001:DB8:A:401::1/128 on router B?

```
group "iBGP" {
        peer-as 65540
        family {
            ipv6 true
        }
}
neighbor "2001:db8:2::2" {
    group "iBGP"
}
neighbor "2001:db8:3::3" {
    group "iBGP"
}
```



a. The IPv6 global address of router A.
b. The IPv6 global address of router D.
c. The IPv6 link-local address of the router D interface towards router A.
d. The configuration does not allow router B to route to 2001:DB8:A:401::1/128.

Answer Key

1. C
2. D
3. B
4. C
5. B
6. C
7. D
8. A
9. D
10. C
11. B
12. D
13. A
14. D
15. D
16. A
17. A
18. C
19. C
20. D
21. B
22. D
23. C
24. B
25. A
26. B
27. B
28. D
29. A
30. D
31. B
32. C
33. A
34. A
35. D
36. A
37. B
38. A
39. A
40. A

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