TCP/IP Networking 2017 Test 6

☐**0** ☐**0** ☐**0** ☐**0** ☐**0** ☐**0**
☐**1** ☐**1** ☐**1** ☐**1** ☐**1** ☐**1**
☐**2** ☐**2** ☐**2** ☐**2** ☐**2** ☐**2**
☐**3** ☐**3** ☐**3** ☐**3** ☐**3** ☐**3**
☐**4** ☐**4** ☐**4** ☐**4** ☐**4** ☐**4**
☐**5** ☐**5** ☐**5** ☐**5** ☐**5** ☐**5**
☐**6** ☐**6** ☐**6** ☐**6** ☐**6** ☐**6**
☐**7** ☐**7** ☐**7** ☐**7** ☐**7** ☐**7**
☐**8** ☐**8** ☐**8** ☐**8** ☐**8** ☐**8**
☐**9** ☐**9** ☐**9** ☐**9** ☐**9** ☐**9**

Grading:
For each question, exactly one of the four proposed answers is correct. If the good answer and only the good answer box is crossed ⇒ +1 point. If one bad answer box is crossed and no other box is crossed ⇒ $-\frac{1}{3} = -0.333$ point. If 0 or more than 1 answer box is crossed ⇒ +0 point.
⟵ Please encode your SCIPER number here and write your full name in the box below. ↓

Name, First Name:

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Question 1 A BGP router R receives from external peers the following advertisements:

(L) From BGP peer $R1$: `DESTINATION = 2001:baba:bebe/48; AS-PATH = A B, NEXT-HOP = 2002:b0b0:baba:a::1`

(S) From BGP peer $R2$: `DESTINATION = 2001:baba/32; AS-PATH = C D E, NEXT-HOP = 2002:b0b0:baba:b::1`.

There is no other attribute than shown. The IGP distances from R to the two next-hops are equal.
The decision process at R processes these two advertisements and makes its choice of best routes. Say what is true.

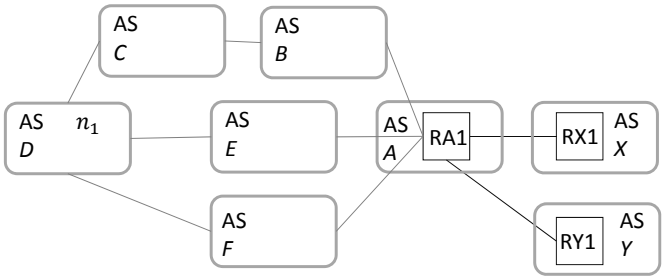
☐ R must select **L** or **S** or none as best route but cannot select both.
☐ R must select **L** and must not select **S** because **L** has a shorter AS-PATH.
☐ R must select **S** and must not select **L** because **S** has a shorter network prefix.
☐ R can select both **L** and **S** as best routes.

Question 2 Say what is true.

1. BGP peers must be onlink of each other.
2. OSPF peers must be onlink of each other.

☐ Both. ☐ 1 and not 2. ☐ None. ☐ 2 and not 1.

Question 3 A, B, C, D, E, F, X, Y are ASs. $RA1, RX1$ and $RY1$ are BGP routers. n_1 is a network prefix advertized by D. The notation `A E D:n1` means a BGP annoucement where `A E D` is the AS path and `n1` is the network prefix. The other attributes are not shown.



Which set of announcements, sent by $RA1$ to $RX1$ and $RY1$, is valid ?

- ☐ to $RX1$: `A B C D:n1`; to $RY1$: `A E D:n1`
- ☐ to $RX1$: `A F D:n1`; to $RY1$: `A B C D:n1`
- ☐ to $RX1$: `A B C D:n1`; to $RY1$: `A B C D:n1`
- ☐ to $RX1$: `A E D:n1`; to $RY1$: `A F D:n1`

Question 4 TCP-Lisa is a modification of ECN-TCP where the multiplicative decrease factor is replaced by $\beta_{LISA} = 0.7$. All the rest is the same as TCP Reno with ECN.

- ☐ Flows with very large RTT obtain a smaller throughput using TCP-Lisa than using TCP Reno with ECN in equivalent conditions, whereas for flows with small RTT the throughputs of both are similar.
- ☐ Flows using TCP-Lisa obtain a larger throughput than flows using TCP Reno with ECN in equivalent conditions.
- ☐ Flows using TCP-Lisa obtain a similar throughput as flows using TCP Reno with ECN in equivalent conditions.
- ☐ Flows using TCP-Lisa obtain a smaller throughput than flows using TCP Reno with ECN in equivalent conditions.

Question 5 Say what is true.

1. BGP peers use TCP to communicate with each other.
2. OSPF peers use TCP to communicate with each other.

☐ Both. ☐ 1 and not 2. ☐ None. ☐ 2 and not 1.

Question 6 Say what is true.

1. When a BGP router detects that a route that it exports is no longer valid it sends a WITHDRAW update.
2. Recursive table lookup is used in the IP forwarding table when some nexthops are not onlink.

☐ 2 and not 1. ☐ Both. ☐ 1 and not 2. ☐ None.

Question 7 What is the TCP friendly rate control protocol (TFRC) ?

- ☐ A method for a UDP application which ensures that its sending rate is similar to what it would obtain if it were using TCP.
- ☐ A method for a UDP application which requires that it mimics the operation of the congestion window in TCP.
- ☐ A generic term that applies to a congestion control module in a version of TCP, such as BBR, which avoids filling network buffers unnecessarily.
- ☐ A generic term that applies to a congestion control module in a version of TCP, such as DCTCP, which employs a non-abrupt adaptation of the congestion window.

Question 8 An AS is made of boundary routers and backbone routers. Boundary routers connect to external networks. Backbone routers are not connected to external networks. All boundary routers are connected to at least one backbone router. The backbone routers form a full mesh.

All routers run OSPF. All boundary routers run BGP. OSPF is redistributed into BGP but BGP is not redistributed into OSPF. All BGP routes are injected into the forwarding table at every router that runs BGP. In order to make sure all transit packets are properly routed through this AS, Homer envisions activating the following functions.

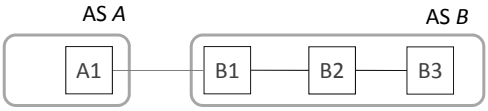
1. backbone routers also run BGP.
2. all routers support recursive table lookup in their forwarding table.

- ☐ The configuration works if 1 alone is activated; 2 may be activated but is not necessary.
- ☐ The configuration works if 2 alone is activated; 1 may be activated but is not necessary.
- ☐ The configuration works if both are activated.
- ☐ The configuration does not work even if both 1 and 2 are activated because some function is missing for transiting packets through the backbone.

Question 9 To which case does the term IBGP apply ?

- ☐ BGP when it is used inside an AS.
- ☐ BGP when it runs on IOS.
- ☐ OSPF when it is used to carry routes obtained from BGP.
- ☐ OSPF when it is used to advertize internal routes to a boundary router.

Question 10 $B1, B2$ and $B3$ are all running BGP and an interior routing protocol. There is no other router in AS B than shown. The plain lines indicate physical connections.



$B1$ receives from BGP router $A1$ the announcement: `DESTINATION = 2001:baba/32; AS-PATH = A C D, NEXT-HOP = 2002:b0b0:baba:b::1`. The decision process at $B1$ selects this route as best route. There was no other BGP announcement to this destination received in B from an external BGP peer. The policy inside AS B is such that this route is accepted by all BGP routers. Say which statement is true.

- ☐ $B3$ receives a BGP announcement with `DESTINATION = 2001:baba/32` from $B2$ and not from $B1$.
- ☐ $B3$ receives a BGP announcement with `DESTINATION = 2001:baba/32` from $B1$ and not from $B2$.
- ☐ $B3$ receives a BGP announcement with `DESTINATION = 2001:baba/32` from $B1$ and one from $B2$. The latter one is chosen by the decision process at $B3$.
- ☐ $B3$ receives a BGP announcement with `DESTINATION = 2001:baba/32` from $B1$ and one from $B2$. The former one is chosen by the decision process at $B3$.

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