TCP/IP Networking 2017 Test 2

☐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
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☐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:

.....

Question 1 *A* sends one unicast IPv4 packet to *C* over Ethernet. The IPv4 destination address observed at point 1 is

☐ the IPv4 address of S1's west interface.
☐ the IPv4 address of S2's west interface.
☐ 255.255.255.255.
☐ *C*'s IPv4 address.

Question 2 A host sends an IPv4 packet with TTL = 255.

☐ This packet cannot be forwarded by a bridge but can be forwarded by a router.
☐ This packet can be forwarded by a router or a bridge.
☐ This packet cannot be forwarded by neither a router nor a bridge.
☐ This packet cannot be forwarded by a router but can be forwarded by a bridge.

Question 3 Lisa makes a local area network by installing 6 Ethernet standard bridges, connected with Ethernet cables to form a ring.

☐ This works because bridges automatically disable one port on one switch.
☐ This does not work because bridges must be cabled without loop.
☐ This works only for unicast traffic; broadcast traffic has to be disabled because it would loop.
☐ This works because bridges learn source MAC addresses on the frames they observe.

Question 4 When an IPv6 host A wants to know the MAC address that corresponds to a target IPv6 address B, it sends an NDP NS message. The IPv6 destination address of this message is:

- ☐ this packet does not have an IP destination address because it is not an IP packet.
- ☐ the link-local broadcast address.
- ☐ the IPv6 broadcast address `ffff:ffff:ffff:ffff:ffff:ffff:ffff:ffff`.
- ☐ a multicast address algorithmically derived from B.

Question 5 A sends one unicast Ethernet frame to C. The MAC destination address observed at point 1 is

- ☐ the MAC address of S2's west interface
- ☐ the MAC address of S1's west interface
- ☐ `ff:ff:ff:ff:ff:ff`
- ☐ C's MAC address

Question 6 Say what is true about the spanning tree protocol.

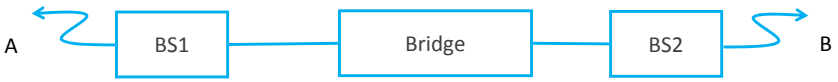
1. bridges compute a shortest path tree to every other bridge
2. bridges elect a root

- ☐ Both.
- ☐ 1 and not 2.
- ☐ 2 and not 1.
- ☐ Neither 1 nor 2.

Question 7 We flip the 17th bit of the IP address: `2001:1::bebe`. What is the result?

- ☐ `2001:8001::bebe`
- ☐ `2001:2::bebe`
- ☐ `2001:0::bebe`
- ☐ `2001:3::bebe`

Question 8 Homer makes a LAN with two WIFi base stations BS1 and BS2, interconnected by Ethernet cables and a bridge. A is associated to BS1 and B is associated to BS2. By which mechanism does the bridge know where to send packets destined to A and B ?



- ☐ The bridge remembers all MAC source addresses and broadcast frames if it does not know where the destination is.
- ☐ The base stations inform the bridge of the presence of A and B (which they know from their association data) using the spanning tree protocol.
- ☐ The spanning tree protocol learns all addresses without intervention of the WiFi association data.
- ☐ The bridge computes shortest paths to all destinations.

Question 9 When an IPv4 host A wants to know the MAC address that corresponds to a next-hop IPv4 address B, say what it can use:

1. the ARP protocol
2. the DHCP protocol

☐ 1 and not 2. ☐ Neither 1 nor 2. ☐ Both. ☐ 2 and not 1.

Question 10 With SLAAC, an IPv6 host obtains:

1. A link-local address.
2. A valid subnet prefix, when a router that participates in SLAAC is present in the subnet.

☐ 1 and not 2. ☐ 2 and not 1. ☐ Neither 1 nor 2. ☐ Both.