TCP/IP Networking 2015 Test 3

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Grading:
For each question there is exactly one correct answer.
If the good answer and only the good answer box is crossed
$\Rightarrow$ +1 point. If one bad answer box is crossed and no other
box is crossed $\Rightarrow -\frac{1}{3}$ point. If 0 or more than 1 answer box
is crossed $\Rightarrow$ 0 point.
$\longleftarrow$ Please encode your SCIPER number here and write
your full name in the box below. $\downarrow$

Name, First Name:

....

Question 1 The sockets used by a TCP server to receive a SYN packet and to receive data after connection establishment ...

☐ are one and the same.

☐ are a single socket bound to two different local ports.

☐ are distinct and bound to different local ports.

■ are distinct, but are bound to the same local port.

Question 2 A sends one block of 2'000 bytes to B in one single socket call. B issues one single socket call in order to receive the data. This socket call is successful (i.e. the call returns and B receives some data). Can B be sure to have received all of the 2'000 bytes sent by A ?

☐ Yes, regardless of whether the application uses UDP or TCP.

☐ No, regardless of whether the application uses UDP or TCP.

■ Yes if the application uses UDP, no if it uses TCP.

☐ Yes if the application uses TCP, no if it uses UDP.

Question 3 A sends data to B using a sliding window protocol over a link of infinite (i.e. very large) bit rate. The achieved throughput ...

■ is proportional to the window size and inversely proportional to the round trip time.

☐ is inversely proportional to the round trip time but does not depend on the window size.

☐ is proportional to the window size but does not depend on the round trip time.

☐ is independent of window size and round trip time.

Question 4 An IPv4 host connected to Ethernet has to send an IP packet to a multicast destination address. In order to determine the MAC destination address, the host will...

☐ send an ARP request and the MAC destination address of the ARP request is deterministically computed from the destination IP address.

☐ send an ARP request and the MAC destination address of the ARP request is the MAC address of the default router.

■ compute the destination MAC address deterministically from the destination IP address.

☐ send an ARP request and the MAC destination address of the ARP request is the MAC broadcast address.

Question 5 A sends data to B using a sliding window protocol. The window size is 5'000 bytes. A has 7 packets ready to send, of size 1'000 bytes each. A sends the first 5 packets to B, then waits. Later, at time t_1, A receives from B a selective acknowledgement, which acknowledges the reception of all packets except the second one. What is possible for A immediately after time t_1 ?

☐ A can send neither the sixth nor the seventh packet.

☐ A can send the sixth and the seventh packets.

☐ A can send the seventh packet but not the sixth.

■ A can send the sixth packet but not the seventh.

Question 6 Over a lossy channel with several intermediate hops, which method of retransmission (hop-by-hop versus end-to-end) provides a higher throughput ?

☐ End-to-end.

☐ Both provide the same throughput.

■ Hop-by-hop.

☐ It depends on the bandwidth-delay product.

Question 7 A bridge receives an Ethernet packet on port `eth0` with destination MAC address equal to ff:ff:ff:ff:ff:ff.

■ The bridge forwards this packet to all ports that are on the spanning tree except to `eth0`.

☐ The bridge forwards this packet to all ports except to `eth0`.

☐ Such packets are never forwarded by bridges.

☐ The bridge forwards this packet to all ports that are not on the spanning tree except to `eth0`.

Question 8 An instance of TCP declares that two consecutive segments are lost. The concatenation of the two segments is smaller than the maximum segment size. May TCP merge the two segments and retransmit them as a single segment ?

☐ No.

■ Yes.

☐ Yes with IPv4, no with IPv6.

☐ No with IPv4, yes with IPv6.

Question 9 When a bridge forwards an Ethernet frame ...

■ it does not modify the MAC header.

☐ it decrements the TTL/HL field in the Ethernet header.

☐ it decrements the TTL/HL fields both in the IP header and in the Ethernet header.

☐ it decrements the TTL/HL field in the IP header.

Question 10 A and B are in different VLANs but they are connected to the same VLAN switch. A sends a packet to B. The MAC destination address, observed at A, is ...

■ the MAC address of A's default router.

☐ a MAC address algorithmically derived from B's MAC address.

☐ a MAC address algorithmically derived from the concatenation of B's MAC address and VLAN label.

☐ the MAC address of B.