TCP/IP Networking 2016 Test 3

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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 web server does `accept()` on a TCP socket bound to port 80.

- ☐ A new socket is created by `accept()`, bound to an ephemeral port allocated by the operating system.
- ☐ No new socket is created but the socket is bound to a second, ephemeral, port allocated by the operating system.
- ■ A new socket is created by `accept()`, also bound to port 80.
- ☐ No new socket is created since the server is listening to a single port (port 80).

Question 2 An IPv4 host must send IGMP join(m), where m is an IPv4 multicast address ...

- ☐ in order to receive packets sent to m or to send packets to m.
- ☐ neither to receive packets sent to m nor to send packets to m.
- ■ before receiving packets sent to m but this is not required for sending to m.
- ☐ before sending packets to m but this is not required for receiving packets sent to m.

Question 3 In the Internet, which layers other than the application layer may, in some cases, perform re-transmission when a packet loss occurs ?

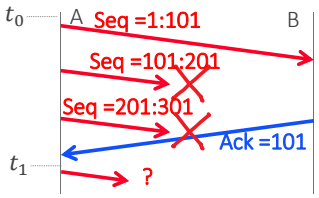
- ■ The transport layer (TCP) and some instances of the MAC layer.
- ☐ The transport layer (TCP) and IP (v4 or v6) when fragmentation occurs.
- ☐ The transport layer (TCP) and IPv4 when fragmentation occurs.
- ☐ The transport layer (TCP) and IPv6 when fragmentation occurs.

Question 4 An application at A sends one block of 1900 bytes of data to B using TCP or UDP. An application at B attempts to receive the data and does a successful `recvfrom()` on a socket. Can B be sure to have received all of the 1900 bytes of the message sent by A ?

- ☐ no in either case.
- ☐ yes in both cases.
- ■ yes with UDP, no with TCP.
- ☐ no with UDP, yes with TCP.

Question 5 A and B use a fixed sliding window protocol. The window size is 300 bytes. At time t_0, the protocol is initialized. Say which of the choices below is allowed for A at time t_1:

- ☐ A may transmit a packet with Seq = 301:501.
- ☐ A may transmit a packet with Seq = 301:601.
- ■ A may transmit a packet with Seq = 301:401.
- ☐ A may not transmit any new data.



Question 6 A TCP sender A detects that the segments 101:201 and 201:301 were lost. The window size is very large and has remained the same as when the segments 101:201 and 201:301 were first sent. When A decides to retransmit these two segments:

- ☐ A must retransmit 2 segments, with sequence numbers 101:201 and 201:301.
- ☐ A may retransmit 1 segment with sequence number 101:201 and must wait for the acknowledgement of this segment before retransmitting 201:301.
- ■ A may retransmit 2 segments, with sequence numbers 101:201 and 201:301 or retransmit one segment with sequence numbers 101:301.
- ☐ A may retransmit 1 segment with sequence number 201:301 and must wait for the acknowledgement of this segment before retransmitting 101:201.

Question 7 Elaine has a computer network with a NAT and a bridge; her equipment is IPv4 only. Now Elaine wants to migrate to IPv6. She does not use multicast. Which of her networking equipments does she need to upgrade ?

- ■ the NAT and not the bridge.
- ☐ both the NAT and the bridge.
- ☐ neither the NAT nor the bridge.
- ☐ the bridge and not the NAT.

Question 8 With TCP, the window size...

- ■ is dynamic, indicated to the receiver by the source and may differ for each side of the connection.
- ☐ is fixed and equal to 64K bytes (= 65536 bytes) by default.
- ☐ is dynamic, indicated to the client by the server and is the same for both sides of the connection.
- ☐ is dynamic with TCPv4 and static with TCPv6.

Question 9 An intermediate system X, which is a bridge or a router, forwards a packet that is made of an Ethernet frame containing an IPv4 packet. In which case does X modify the MAC destination address ?

- ■ When X is a router but not when X is a bridge.
- ☐ Neither when X is a bridge nor when it is a router.
- ☐ When X is a bridge but not when X is a router.
- ☐ When X is a bridge and when X is a router.

Question 10 An IPv6 host connected to Ethernet has to send an IPv6 packet to an IPv6 multicast destination address A. In order to determine the destination MAC address M to be used when sending this packet in an Ethernet frame, the host will...

- ☐ send a Neighbour Solicitation message to all nodes in the subnetwork.
- ☐ send a Neighbour Solicitation message multicast to all nodes in the subnetwork that have one IPv6 address with the same 32 low order bits as those of A.
- ☐ send a Neighbour Solicitation message to the IPv6 multicast address A using a MAC layer broadcast.
- ■ deterministically compute M from A.