TCP/IP Networking 2016 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
☐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:

.....

Question 1 A sends an Ethernet frame that contains an IP packet to C. The MAC destination address observed at A is...

☐ The MAC address of the interface of $S1$ that links to A.

■ The MAC address of the interface of $R1$ that links to $S1$.

☐ The MAC address of A.

☐ The MAC address of C.

Question 2 With DHCP a host can acquire...

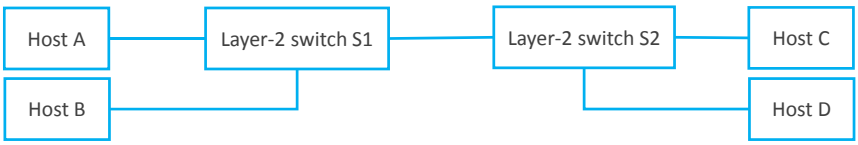
☐ its IP address, its network mask and the IP address of a DNS server but never the IP address of its default gateway.

■ its IP address, its network mask, the IP address of its default gateway and the IP address of a DNS server.

☐ its IP address, its network mask and the IP address of its default gateway but never the IP address of a DNS server.

☐ its IP address, the IP address of its default gateway and the IP address of a DNS server but never its network mask.

Question 3 How many frames can be transmitted in parallel in this network ?



■ ≥ 4.

☐ 2.

☐ 1.

☐ 3.

Question 4 A web server at EPFL sends an IP packet to Elaine, who is at home behind a NAT. No VPN is used. The IP destination address of the packet sent by the web server is ...

- ☐ the IP address of a DNS server.
- ☐ the private (LAN) IP address of Elaine's NAT.
- ☐ the IP address of Elaine's device in her home network.
- ■ the public (WAN) IP address of Elaine's NAT.

Question 5 When a layer-2 switch forwards a packet...

- ☐ it decrements the TTL if it is an IPv4 packet but does not modify the HL if it is an IPv6 packet.
- ☐ it decrements the HL if it is an IPv6 packet but does not modify the TTL if it is an IPv4 packet.
- ☐ it decrements the TTL if it is an IPv4 packet and the HL if it is an IPv6 packet.
- ■ it does not modify the IPv4 TTL nor the IPv6 HL.

Question 6 A sends an Ethernet frame that contains an IP packet to C. The MAC destination address observed at A is...

- ☐ The MAC address of the interface of $S1$ that links to A.
- ☐ The MAC address of the interface of $S2$ that links to $S1$.
- ■ The MAC address of C.
- ☐ The MAC address of A.

Question 7 Elaine, at home in Lausanne behind a NAT, receives an IP packet from a web server in California. The IP source address of the packet received by Elaine is ...

- ■ the IP address of the web server.
- ☐ the IP address of Elaine's DHCP server.
- ☐ the private (LAN) IP address of the NAT.
- ☐ the public (WAN) IP address of the NAT.

Question 8 Joe builds a network by first connecting 3 bridges to each other, then connecting each host to one of the 3 bridges.

- ☐ This does not work because the topology has a loop.
- ☐ This works for unicast frames but not for broadcast frames (such as ARP requests).
- ■ This works because the spanning tree protocol disables at least one port to prevent a loop from happening.
- ☐ This works because bridges compute shortest paths to each destination.

Question 9 The goal of an ARP request is to...

- [x] Determine the MAC address of an interface that has a given IP address.
- [ ] Determine the IP address of an interface that has a given MAC address.
- [ ] Determine the MAC address of the DNS server.
- [ ] Determine the IP address of the default gateway.

Question 10 A host A receives an IPv6 packet with Hop Limit = 255.

- [ ] This is an error, a received packet should always have a Hop Limit < 255.
- [ ] The source of the packet is at least 1 hop away from A.
- [ ] The source of the packet is 255 hops away from A.
- [x] The source of the packet is onlink with A.

Corrected