TCP/IP Networking 2016 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:
>
> . . . .

Question 1   The Simpscom network owns the block **23.23/16** and is a large network with 100 routers. All subnets use a 24-bit prefix. Bart is connected to the subnet **23.23.23/24** and his default gateway is router R1, with address **23.23.23.1**. Bart has a static IP configuration with correct IP address and default gateway but with incorrect network mask, equal to **255.255.0.0**. All other elements in this network are correcly configured. Lisa is connected to the subnet **23.23.15/24** and has thus a correct configuration. Her default gateway is router R2, with address **23.23.15.1**. We want to enable communication between Bart and Lisa without modifying Bart's configuration. Homer proposes the possible following solutions:

1. Let R1 perform proxy ARP on its interface **23.23.23.1** for all target destinations.

2. Let R2 perform proxy ARP on its interface **23.23.15.1** for all target destinations.

Say what is true:

☐ Nothing is required, it works as is because the incorrect subnet mask at Bart's machine is shorter than the correct mask.

☐ 2 alone is sufficient to solve the problem.

☐ Both 1 and 2 are required to solve the problem.

■ 1 alone is sufficient to solve the problem.

Question 2   When a DNS server performs a reverse DNS lookup for an IPv4 address, it ...

☐ scans all AAAA records that map a DNS name to this IP address.

■ searches for a PTR record that maps this IP address to a DNS name.

☐ sends a reverse DNS query to the host that has this IPv4 address.

☐ scans all A records that map a DNS name to this IP address.

Question 3   A dual stack host A wants to communicate with a web server S that supports only IPv6. How does A know that IPv6 should be used ?

- ■ With the DNS.
- ☐ A tries to open a TCP connection to S using IPv4 and IPv6 and sees what works.
- ☐ A pings S and analyzes the ICMP reply messages.
- ☐ A uses reverse ARP to determine the IP address of S and analyzes the ARP reply messages.

Question 4   AS A owns the prefix 9/8 and announces it to all its neigbouring ASs. A does not announce any prefix that is more specific than 9/8. The BGP routers of AS B, who is a neighbouring AS of A, accept these announcements. A bogus BGP router of a corrupt AS X that is also neighbour of B announces `9.9.9/24, AS-path = X A` to B, who also accepts this announcement. B does not aggregate prefixes. BGP routers in B redistributes BGP into B's IGP, which is able to support it. What happens to IP packets from B to 9.9.9/24 ?

- ☐ they are dropped.
- ■ they are forwarded to X.
- ☐ they are forwarded to A.
- ☐ they are forwarded either to X or to A, depending on the attributes of the announcements received by B and the IGP distances inside B.

Question 5   The end-to-end principle of the Internet means...

- ☐ Congestion control should be implemented in hosts only.
- ☐ Application layer gateways should work as intermediate systems of the application layer.
- ☐ Intermediate systems at the network layer should be avoided whenever possible.
- ■ Intermediate systems at the application layer should be avoided whenever possible.

Question 6   A is an IPv6-only host connected to the internet-v6. S is an IPv4-only server connected to the internet-v4. A communicates with S using a NAT64 provided by A's ISP. Say what is true:

1. The destination address in the packets sent by A to S, observed at A, is an IPv6 address algorithmically derived from S's IPv4 address.
2. The destination address in the packets sent by A to S, observed at S, is S's IPv4 address.

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

Question 7   In this AS, every router runs BGP and injects the routes learnt from BGP into its forwarding table. Recursive table lookup is enabled. Say what is required if we want all external prefixes to be reachable by all routers in this AS.

- ■ nothing else.
- ☐ set the BGP import policy to reject routes learnt by the IGP.
- ☐ disable the redistribution of routes learnt by E-BGP into I-BGP.
- ☐ redistribute the routes learnt by BGP into the IGP.

Question 8 A host A sends IP packets of size 1500 bytes to B; on the path between A and B there is a link from router R1 ro router R2 with `MTU=1400`. Say what is true:

1. with IPv4, R1 fragments the packets and R2 re-assembles the fragments

2. with IPv6, R1 fragments the packets but re-assembly can be performed only by B

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

Question 9 The DNS server of EPFL changes the IPv4 address of `ssc.epfl.ch`. How will DNS servers outside EPFL learn the new address ?

■ After expiration of the TTL in the cached record, by contacting the EPFL DNS server.

☐ The DNS server of EPFL sends a DNS-UPDATE to the DNS servers of the domain `.ch`, who then in turn send a DNS-UPDATE to all DNS servers who cached the records of `ssc.epfl.ch`.

☐ Never, because only the DNS servers of EPFL keep a copy of this record and the other servers don't need to be informed.

☐ The DNS server of EPFL sends a DNS-UPDATE to the DNS servers of the domain `.ch`, who then in turn send a DNS-UPDATE to the root DNS servers.

Question 10 Say what is true.

1. The goal of route flap dampening is to prevent oscillations due to routes being frequently withdrawn and soon re-announced.

2. The goal of a BGP confederation is to reduce the number of I-BGP peerings inside one AS.

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

CORRECTED