Spring 2014
Computer Networks
CMPE323

Quiz 3

Questions	Points
Q1	$/\frac{100}{3}\%$
Q2	$/\frac{100}{3}\%$
Q3	$/\frac{100}{3}\%$

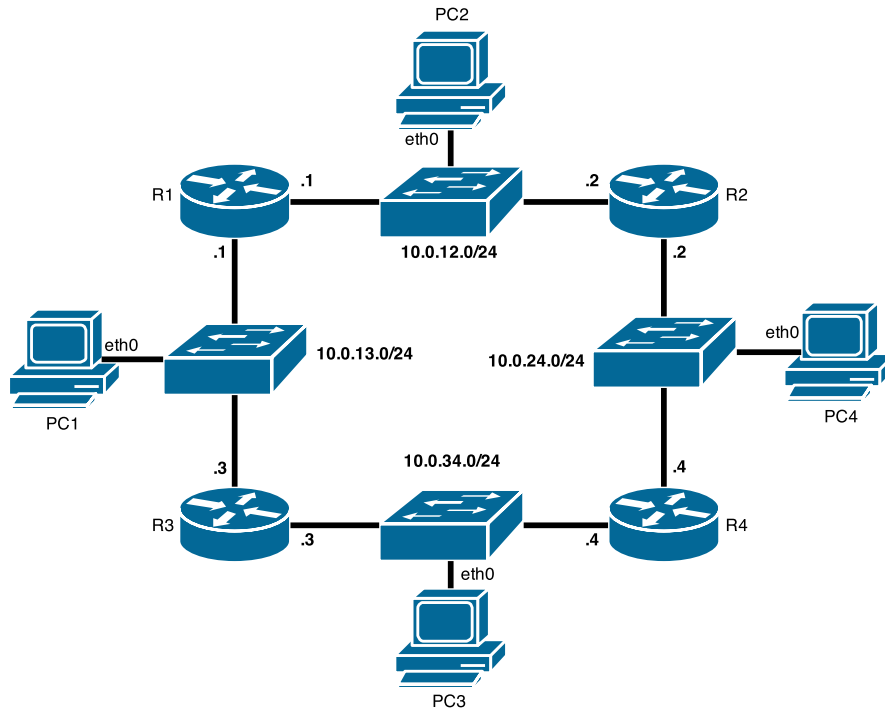**Student name:**   **Student ID:**

Question 1:

Figure 1: Four inter-connected networks.

Consider Figure 1 where the routers R1, R2, and R3 are all correctly configured with RIPv2 such that any node in the network can ping any node.

Questions: if you view the routing table of R3 (i.e. using the command `show ip route`), what would be the answer of the following questions:

- What would be the next-hop IP address (aka via address) for reaching the network `10.0.12.0/24`?

- What would be the metric that is associated with the route of the same network (i.e. `10.0.12.0./24`)?

- From the perspective of R3, what would be the metric of the updates that are received from R1 for the same network?

- From the perspective of R3, what would be the metric of the updates that are received from R4 for the same network?

Question 2:

Given the same topology as depicted in Figure 1 and knowing that the default gateway of PC1 is R1, what would be the content of the Access-Control List (ACL) that, if applied as a firewall rule in R1, would result in permitting all packets except dropping ones that meet the following criteria:

- From PC1 that go to any PC in the network `10.0.12.0/24`,

- AND using the TCP protocol,

- AND using the destination port 80,

Use the following syntax to describe the ACL entries (note: there is an implicit deny at the end of the ACL):

`<action> <proto> <sip> <wmask> [eq <sp>] <dip> <wmask> [eq <dp>]`

Where:

- `<action>` is either `permit` or `deny`.

- `<proto>` is either `ip`, `tcp`, `udp`, or `icmp`.

- `<sip>` is the source IP address.

- `<dip>` is the destination IP address.

- `<wmask>` is a wild-card mask (the opposite of a subnet mask, a bit of 0 corresponds to a bit that must match, and 1 for otherwise).

Questions:

- Write down the content of the ACL using the syntax above.

- What is the interface on R1 that you would apply the ACL on (mark a circle on the interface in Figure 1)?

- What is the direction by which you apply the ACL on the interface (i.e. inbound or outbound to the router)?

Question 3:

Consider the same topology as depicted in Figure 1, and assume the following:

- PC2 and PC4 use R2 as their default gateway.

- R2 has NAPT (Network Address and Port Translation) configured such that packets that are sourced from 10.0.24.0/24 and destined to 10.0.12.0/24 have their source addresses translated.

- The address translation aims at allowing maximum number of connections from 10.0.24.0/24 to 10.0.12.0/24 such that the translated source IP address is 10.0.12.2.

- PC4 sent a UDP packet to PC2 with the source port of 50,000 and the destination port of 53.

Question:

- What would be a valid NAPT translation entry in the NAT table of R2:
  - Protocol:
  - Source IP address:
  - Destination IP address:
  - Source port:
  - Destination port: