YORK UNIVERSITÉ UNIVERSITY

EECS 3213: Computer Networks, Fall 2015
Instructor: Natalija Vlajic
Time Allowed: **20 minutes**

Quiz 1

Student Name: _____

Student Number: _____

1. [1 point]
In class, we have discussed the advantages of packet switching over full-mesh (i.e., direct link) network infrastructure/topology, one of them being *scalability*.
What, exactly, does it mean when we refer to packet switching topology as being 'more scalable'? Explain in no more than 2-3 sentences.

'More scalable' means that adding new stations/computers is easier to implement and generally less costly.
In particular, in case of packet switching topology, adding a new end-computer to a network comprising n other computers would require that ONLY ONE additional cable be added (from the new end-computer to the nearest switch) and would NOT require that any modifications be made at any of the other end-computers.
In case of full-mesh topology, adding a new end-computer would require that n cables be placed between the new and each of the existing n computers, and a new NIC would have to be added to each of those n computers.

2. [1 points]
Suppose a computer is moved from one department of a large scale company to another. Answer the questions below, using at most two sentences per each answer.

(a) Does the physical address need to change?

The physical address does not change. It is globally unique to the computer's NIC card.

(b) Does the IP address need to change?

The IP address may need to be changed to reflect a new subnetwork ID and host ID.

3. [1 point]

Suppose a user has two browsers (i.e., browser applications) active at the same time and suppose that the two applications are accessing the same Web server to retrieve Web documents. How does the server tell the difference between the two applications/browsers, given that they both run on the same computer?

A client application generates an ephemeral port number for every TCP connection it sets up. An HTTP request connection is uniquely specified by the five parameters (TCP, client IP address, client port number, server IP address, server port number = 80).
The two applications in the above situations will have different ephemeral/client port numbers and will thus be distinguishable to the server.

4. [1 point]
The below output is (most likely) obtained with which of the following three Windows utilities: ipconfig, ping, tracert.

```
 1     1 ms    <1 ms     1 ms  192.168.1.1
 2     *        *        *     Request timed out.
 3    13 ms    11 ms    11 ms  209.148.245.209
 4    10 ms    11 ms    11 ms  69.63.248.181
 5    21 ms    10 ms     9 ms  209.148.224.246
 6    11 ms    11 ms    14 ms  orion.ip4.torontointernetxchange.net [206.108.34.40]
 7    11 ms    10 ms     9 ms  be202.p01-york.orion.on.ca [66.97.16.25]
 8    11 ms    11 ms    11 ms  GTANET-ORION-RNE.DIST2-TORO.IP.orion.on.ca [66.97.23.126]
 9    11 ms    11 ms    11 ms  yorku-york-hub-if-re.gtanet.ca [205.211.95.130]
10     9 ms    10 ms    10 ms  core01-border.gw.yorku.ca [130.63.27.17]
11    17 ms    11 ms    11 ms  130.63.2.62
12    11 ms    11 ms    14 ms  gold.cs.yorku.ca [130.63.92.24]
```

tracert

5. [1 point]
Signal s(t) is composed of the following three simple analog signals s1(t), s2(t), s3(t):

$$s1(t) = A \cdot \sin(2\pi ft) \qquad s2(t) = A \cdot \sin(2\pi ft + \pi/2) \qquad s3(t) = A \cdot \sin(2\pi ft + \pi)$$

Use the diagram below to sketch s(t)=s1(t)+s2(t)+s3(t), assuming f=1[Hz].