ITS 323 – QUIZ 1 (CS) ANSWERS

First name: _____   Last name: _____

ID: _____   Total Marks: _____

                                                                                                    out of 10

Email Address: _____@hotmail/gmail/other (that you used on Maillist)

Question 1 [2 marks]

True or false (circle the correct answer, T or F):

a) A web browser, such as Firefox or Internet Explorer, would normally implement an entire TCP/IP stack (all layers).

                                                                                                    T / F

b) The Internet layered model includes the Network layer, Transport layer and Session layer.

                                                                                                    T / F

c) Most of the important protocols used in the Internet (e.g. TCP and IP) were developed by the International Organisation for Standardisation (ISO).

                                                                                                    T / F

d) Computer X (in Bangkok) is communicating across an internet with Computer Y (in Hong Kong) using the TCP/IP Protocol Architecture. Both Computer X and Y must implement the same Data Link layer protocol.

                                                                                                    T / F

Answer

a. F – Web browser implements HTTP (and other application layer protocols). It doesn't implement transport or lower layers.

b. F – The Internet layered model does not include the Session layer.

c. F – Most Internet protocols were created by IETF (and individuals)

d. F – The two computers may use different link technologies (and hence different Data Link layer protocols) – they communicate because using the common Network protocol.

Question 2 [3 marks]

Consider the network shown below in which two cable links are used to connect A to B (via C).

A	3km	C	6km	B
	?		100Mb/s	
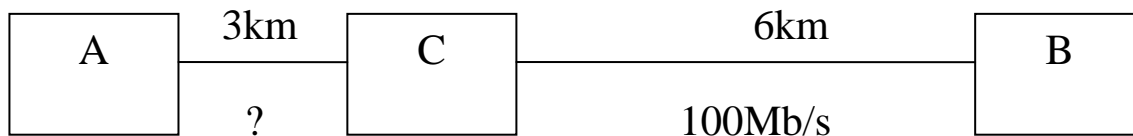
Queuing delay is
10usec

If a message of size 2000 bits has to be sent from A to B with a maximum delay of 125usec, then what is the minimum data rate is required over the first link?

You can assume the transmission velocity is 2×10^8 m/s for each cable. Also assume there are no processing delays at any node, and no queuing delay at nodes A or B.

Answer

Propagation over first link = 3000 / 200000000 = 15usec

Propagation over second link = 30usec

Transmission over second link = 2000/100000000 = 20usec

Queeuing delay = 10usec

So far the total delay is 75usec. Must be less than 125, so maximum for first link is 50usec

Transmission over first link = 50usec = 2000 / rate

Therefore minimum rate = 2000 / 50usec = 40Mb/s

Question 3 [1 mark]

A computer receives 6 packets, and the delay of each packet is:

    Packet 1:   500us
    Packet 2:   300us
    Packet 3:   400us
    Packet 4:   500us
    Packet 5:   400us
    Packet 6:   400us

What is the jitter measured at the receiver?

Answer:

The difference between delays are: 200, 100, 100, 100 and 0. The jitter is 500/5 = 100us.

Question 4 [2 marks]

An instant messaging application sends a 100 byte message. The protocol stack introduces 50 bytes of header per message. Assume there is no segmentation (that is, messages are *not* broken into smaller segments) and no other overheads are present. What throughput can be achieved on a 1Mb/s ADSL link?

Answer

100 bytes of data and 50 bytes of header gives efficiency of 2/3. Therefore throughput is 0.66Mb/s (ie. 666kb/s).

Question 5 [2 marks]

Circle the type of address that the following examples correspond to in the Internet layered model.

Example:		Address Type:			
a) www.siit.tu.ac.th		Physical	Logical	Port	Application
b) steve@hotmail.com		Physical	Logical	Port	Application
c) 192.16.36.12		Physical	Logical	Port	Application
d) 00:18:40:E3:E3:B3		Physical	Logical	Port	Application

Answer

a. Application

b. Application

c. Logical

d. Physical