	<b>15CSCN01I</b> <b>Class Test</b> <b>2015/2016</b>
Module Title: Introduction to Computer Networks and Communications	
Module Leader: Dr. Amal ElNahas	Semester One
Assessment Weight: 20%	Due Date: 5/11/1215

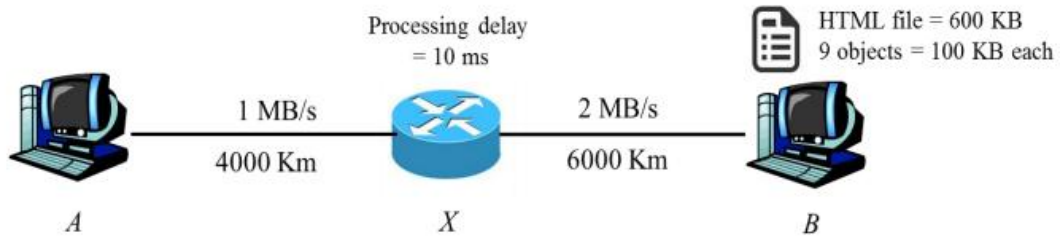
**Answer all questions:**

1. Identify the correct order in which the following actions take place in an interaction between a web browser and a web server.:

- The web browser requests a web page using HTTP
- The web browser establishes a TCP connection with the web server
- The web server sends the requested page using HTTP
- The web browser resolves the domain name using DNS

[8 marks]

2. Two devices, A and B, are connected via a router, X, as shown in the figure below. Link AX is 4000 Km long and has data rate  $R_1 = 1 \text{ MB/s}$ ; while link XB is 6000 Km long and has data rate  $R_2 = 2 \text{ MB/s}$ . The propagation speed on both links is  $2.0 \times 10^8 \text{ m/s}$ . The server on A is trying to send a web page to B that consists of an HTML file of size 600 KB.



a) Calculate the RTT (time for one bit to go from A to B and back from B to A)

[6 marks]

b) What is the total delay in transferring the webpage?

[6marks]

[Total: 12 marks]

3. Consider a client A downloading a file of size 1 Mbytes from a server B. To transfer the file, the server breaks it into blocks of 512 bytes and sends these blocks, one after the other, to the client. Assume there is one channel between the sender and the receiver. If the server's transmission speed is 1 Mbits/sec,

propagation delay is 2 msec, how long will it take from the moment the server receives the client's request till completing sending the whole file?

[10 marks]

### **Model Answers**

1. The correct order is the following:

d – a – b – c

2. A) Total propagation delay =  $10/(2 \cdot 10^5) = 0.05$  msec

Propagation delay is the time needed for 1 bit to travel from A to B.

Total time needed to go from A to B then back =  $2 \cdot \text{propagation delay} = 0.1$  msec

b) Total delay in transferring the web page = propagation delay + transmission delay + processing delay

Total delay =  $0.05 \cdot 10^{-3} + 600/10^3 + 600/2 \cdot 10^3 + 0.01 = 0.91$  sec

3. Number of blocks =  $1024 \cdot 1024 / 512 = 2048$  blocks

Time to send one block =  $512 \cdot 8 / 10^6 + 0.002 = 6.096$  msec

Total time to send all blocks =  $2048 \cdot 6.096 = 12.48$  sec