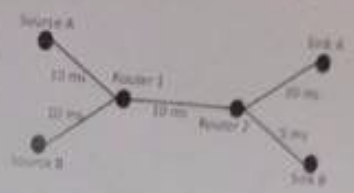
26.05.2017

2016-2017 Computer Networks and Technologies - Final Exam
26.05.2017 – 17:00 – Duration: 1 hour, Books and notes are closed. Good Luck.

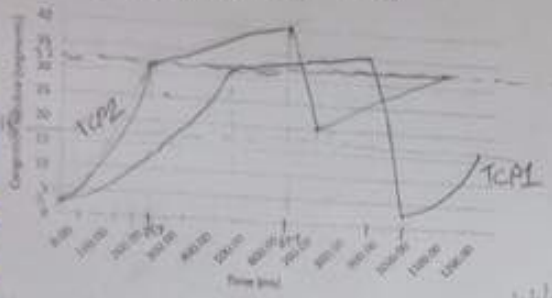
TCP Congestion Control (30 p) – Consider the following network diagram for this problem. Assume that there are two parallel TCP transmissions (*TCP1 and TCP2*) inside the network. *TCP1* is between Source A and Sink A and uses *TCP Tahoe*. *TCP2* is between Source B and Sink B and uses *TCP Reno*. Initial ssthresh values is set to 32 for both transmissions. Note that there is no additional delay through forwarding, thus RTT is only twice of sum of delays indicated on each link.



a) For transmission TCP1, draw the resulting congestion window, assuming that a packet loss (triple duplicate ACK) is detected at time t=800 ms.

b) For transmission TCP2, draw the resulting congestion window, assuming that a packet loss (triple duplicate ACK) is detected at time t=650 ms.

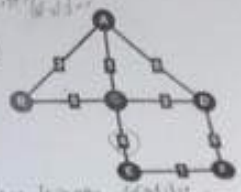
Use the blank graphic drawing below both of your answers.



Shortest Path Problem (25 p) –

a) Run the Dijkstra algorithm to find the shortest paths from **B** to all other nodes on the network represented by the network given.

b) What's is shortest path from **B to F** and what is the length of this path?



3. **IP Fragmentation (25 p) -** Consider sending a 2400-byte datagram into a link that has an MTU of 700 bytes. Suppose the original datagram is stamped with the identification number 422.

a) How many fragments are generated?

b) What are the values of fields in each IP datagram(s) generated related to fragmentation?

4. **Routing (20 p) -** Consider a datagram network using 8-bit host addresses. Suppose a router uses longest-prefix matching and has the following forwarding table. For each of the four interfaces, give the associated range of destination host addresses and the number of addresses in each range.

Prefix Match	Interface
00	0
01	1
10	2
11	3