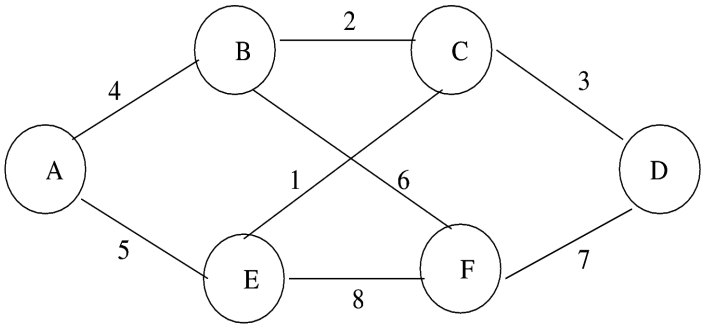
Department of Computer Science and Engg, IIT Bombay
CS 348: Computer Networks Quiz2: 29th Oct 2012, 08:30 – 09:30
Handwritten notes permitted. No photocopies. Weightage: 10%, Max Marks – 30
Answer in the space provided below each question. Extra sheets will not be provided.

Write your Roll Number here: _____

Q1: Consider the network of routers shown below, running OSPF. Show the steps in the creation of the routing table at router A. **(5 marks)**



Q2: Consider a source S using TCP-Tahoe (slow-start and congestion-avoidance mechanisms) to send data to a destination D. Assume that the connection has a constant Round-Trip-Time (RTT), there are no transmission errors and there is no other traffic on the network. Suppose the intial value of ssthresh is 32, the Advertised-Window is constant at 64, and the connection is able to carry 32 packets per RTT (if 33 or more are sent in one RTT, there will be a packet loss). Draw a graph of sending window behaviour (number of packets (cwnd) sent versus time (in units of RTT)), till there are 2 packet losses. **(5 marks)**

Write your Roll Number here: _____

Q3: Two hosts, H1 and H2 establish a TCP connection between themselves. H1 used an initial sequence number of 601, while H2 used the initial sequence number of 1550. H1 sends a total of 300 bytes during the connection, and H2 sent 1000 bytes. What is the sequence number and the acknowledgement number of the very last packet sent by H2? **(5 marks)**

Q4: Consider a source using TCP-Reno (fast-retransmit and fast-recovery mechanisms) to send data to a destination. Suppose the RTT of the link is 800 ms and the sender's window size is 8 segments. The sender sends segments at a regular rate of one every 100 ms, and the receiver sends ACKs back at the same rate without delay. A segment is lost, and the receiver sends 3 duplicate ACKs to trigger the fast-retransmit. Suppose the sender waits for ACK of the retransmitted segment before advancing the window, how much total time has the sender lost (as compared to lossless transmission)? **(5 marks)**

Q5: Consider a simple UDP-based protocol for requesting files. The client sends an initial file request and the server answers with the first data packet. Client and server then continue with a stop-and-wait transmission mechanism. Describe a scenario by which a client might request one file but get another. **(5 marks)**

Q6: Suggest a method for marshalling (packing) a linked list while using RPC. **(5 marks)**