Assignment consists of the following problems:

1. a. TCP sends a segment at 5:30:20 and receives the acknowledgement at 5:30:25. What is the new value for RTT if the previous RTT was 4 seconds?

b. TCP sends a segment at 4:30:20. It does not receive an acknowledgement and at 4:30:25 it retransmits the segment. An acknowledgement is received at 4:30:27. What is the new value for RTT if the previous RTT was 4 seconds?

2. What are the maximum and minimum sizes of the TCP header?

3. What can you say about the TCP segment in which the value for the control field is:
   a. 000000
   b. 000001
   c. 010001
   d. 000010
   e. 010010
4. TCP opens a connection using an initial sequence number (ISN) of 14,534. The other host responds with its own initial sequence number of 21,732. Show the first 3 TCP segments (SYN and ACK values) during the connection establishment.

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Client           Server


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5. A TCP connection is in the FIN-WAIT-1 state. The following events occur—one after the other.
   a. An ACK segment is received
   b. A FIN segment is received
   c. Time-out occurs.

Does this occur at the client or the server? What is the state of the connection after each event? What action is taken after each event?

6. A TCP connection is in the SYN-SENT state. The following events occur:
   a. A SYN + ACK segment is received
   b. A FIN segment is received
   c. A time-out occurs.

Does this occur at the client or the server? What is the state of the connection after each event? What action is taken after each event?
7. Problem 5, page 284

8. Problem 7, page 284 [Assume the protocol has been in operation for some time and that: the sender is in state "Wait for a call from above" and receiver is in a state "Wait for 0 from below"]. Now draw a trace (as in notes and Figure 3.16) for the distinct cases:

a) packet 0 from sender is corrupted and
b) ACK 1 from receiver is lost (after pkt 0 has been sent, ACK'd and ACK correctly received)

9. Problem 18, page 286 (extra credit - not required)

Due at beginning of class on October 21. Submissions should be typed and should contain a completed honor statement.