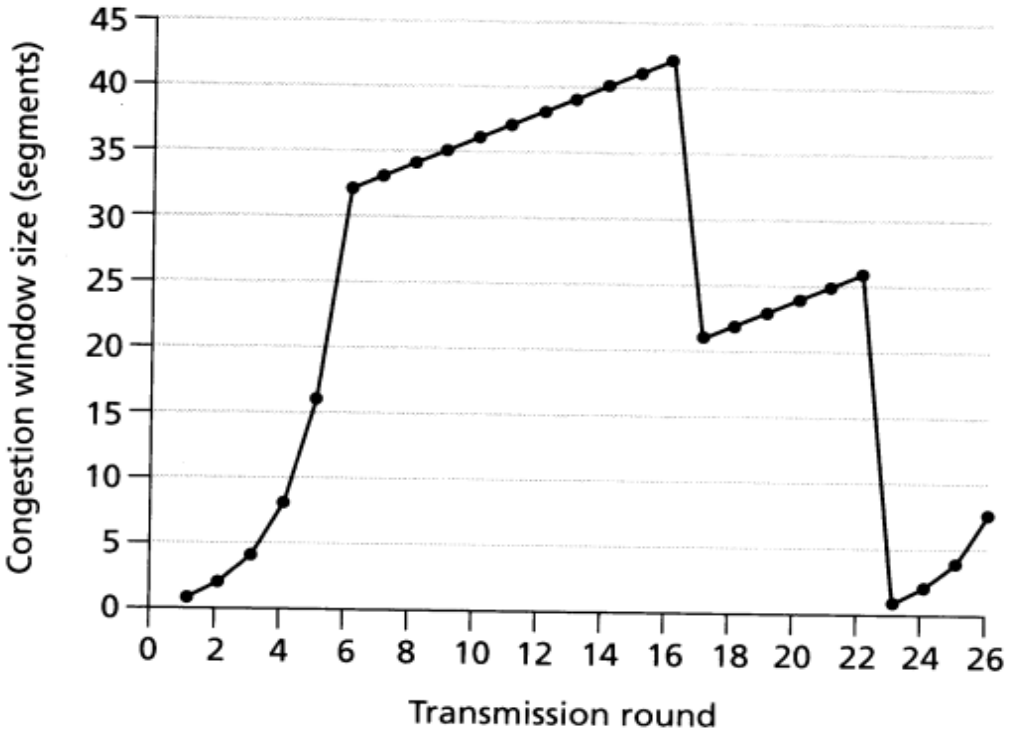
TCP Congestion Control Exercises

In the following, *cwind* stands for Congestion Window and *ssthreshold* stands for Slow Start Threshold.

1. The difference between “Flow Control” and “Congestion Control” as applied to TCP transmission ?
2. When the retransmission timer expires at the sender, the value of *ssthreshold* is set to ?.
3. *cwind* parameter is taken from :

   a) sender tcp header
   b) receiver tcp header
   c) sender tcp's window parameter
   e) receiver tcp's window
   e) None of the above

4. When TCP is in slow start, receipt of 2 ACKs before timeout results in *cwind* being increased by MSS bytes ?
5. a) *ssthreshold* parameter determines when ?.
6. In congestion avoidance phase, TCP's send rate increases ?.
7. Why does TCP Reno get rid of slow start phase when a triple duplicate ACK is received? .
8. What is “fast re-transmit”?
9. What is “fast recovery”? .
10. The picture below shows the behavior of a TCP Reno.



a. Identify time intervals where TCP slow-start is operating.

b. Identify time intervals where TCP congestion-avoidance is operating

c. After the 16th transmission round, is segment loss detected by a triple duplicate ACK or by a timeout event?

d. After the 22nd transmission round, is segment loss detected by a triple duplicate ACK or by a timeout event?

e. What is the *ssthreshold* value at the first transmission round?

f. What is the *ssthreshold* value at the 18th transmission round?

g. What is the *ssthreshold* value at the 24th transmission round?

h. What will be the values of *cwind* and *ssthreshold* if packet loss is detected after the 26th round by receipt of triple duplicate ACKs?