

Part B

Question 1

$$SRTT = (\alpha \cdot SRTT) + (1 - \alpha) \cdot R$$

$$SRTT = 125 \text{ ms}$$

$$RT = 80 \text{ ms}$$

$$\alpha = 0.875$$

Iteration #	SRTT	$(\alpha \cdot SRTT) + (1 - \alpha) \cdot R$
0	125	
1	119.375	119.375
2	114.453	114.453
3	110.146	110.146
4	106.378	106.378
5	103.081	103.081
6	100.196	100.196
7	97.672	97.672

It would take 9 iterations to bring the value of SRTT below 100.

Question 2

$$RTTVAR = \beta \cdot RTTVAR + (1 - \beta) \cdot |SRTT - R|$$

$$RTO = SRTT + 4 \cdot RTTVAR$$

Timeout if $RTT > RTO$

α	0.875
β	0.75
Initial SRTT	100 ms
Initial RTTVAR	100 ms
RTO_{min}	400 ms
$R_{Regular}$	150 ms
$R_{for \text{ every } N'th}$	500 ms

Question 3

- (a) Rounds 1-7 and 22-26 are the transmission rounds when TCP is in slow mode.
- (b) After the 13th transmission round, the segment loss is detected by a triple duplicate ack as the cwnd was cut in half.
- (c) After the 21st transmission round, the segment loss is detected by a timeout because the cwnd has fallen to 1 in round 22.
- (d) The value must be 64 because this is the cwnd value after which additive increase begins at round 8.
- (e) A segment loss is detected at round 13 with cwnd = 70, therefore ssthresh is now equal to $\text{cwnd}/2 = 35$.
- (f) A segment loss is detected at round 21 with cwnd = 42, therefore ssthresh is now equal to $\text{cwnd}/2 = 21$.
- (g) A segment loss is detected after 26th round with cwnd = 16, so ssthresh will be set to 8 and cwnd will be set to 8.