

## Homework # 4 - 4

6.23	Time (t)	A sends	A receives	R's queue	R sends	R drops
	0	Packet 1			Packet 1	
	1	packet 2	ACK 1		Packet 2	
	2	Packet 3, 4	ACK 2		Packet 4	
	3	packets 5, 6, 7	ACK 3		packets 5	
	4		ACK 4		Packet 6	
	5		ACK 5		Packet 7	
	6		ACK 6		Packet 8	
	7		ACK 7		Packet 9	
	8	packet 8, 9, 10			Packet 10	

6.27. The time intervals - representing slow start on startup, slow start after timeout, and linear-increase-congestion avoidance are as follows in the graph

- In this time interval between 0.5 and 1.9 sec it can be noticed that the window size remains fixed in this region. This is possible only when the router queue is full and more ACK's are not received by the sender.
- As soon as the queue gets space, the congestion window resumes normal functioning and the size is decided by the ACKs that are received.
- Trace is Fast retransmit and Fast recovery which is not present
- Both lack congestion avoidance

6.28; The download speed counter keeps on fluctuating during the course of the transfer. Congestion control mechanism will cause changes in the size of congestion window. This will lead to fluctuations in the transfer rate because the router will change the number of packets that get through it thus affecting overall speed