Problem 3.

a) The assumptions are:

- Only TCP connections traverse the bottleneck link
- The connections have the same RTT value
- Only a single connection is associated with a source-destination pair.
- The hosts have sufficiently large amount of data to transfer (therefore the analysis can focus on congestion avoidance and not slow start phase)
- Packet loss occurs due to congestion only

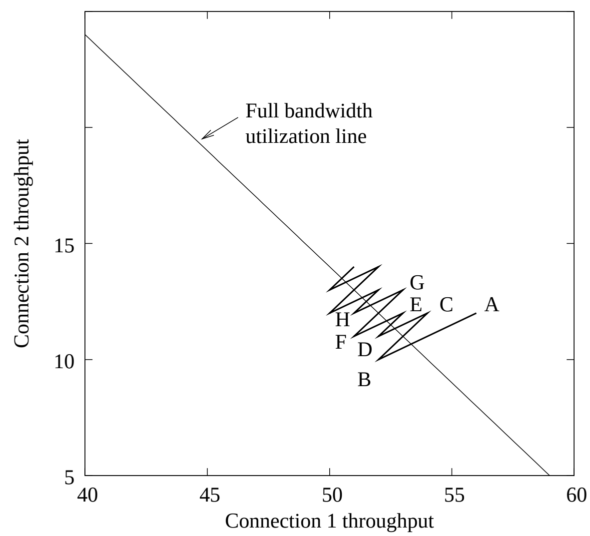
b)

$$\begin{aligned} R &= 2560 \text{ Kbps} \\ &= 2560 \text{ Kbps} \times \frac{1 \text{ byte}}{8 \text{ bits}} \times \frac{1 \text{ MSS}}{1 \text{ Kbyte}} \times \frac{200 \times 10^{-3} \text{ sec}}{1 \text{ RTT}} \\ &= 64 \text{ MSS/RTT} \end{aligned}$$

This is the maximum sustainable rate.

The table of $CongWin$ values and resulting throughput demand is shown below:

$CongWin_1$	$CongWin_2$	Throughput	Point
56	12	68	A
54	11	65	
52	10	62	B
53	11	64	
54	12	66	C
52	11	63	D
53	12	65	E
51	11	62	F
52	12	64	
53	13	66	G
51	12	63	H
⋮	⋮	⋮	



The trend continues even beyond the equal bandwidth share point due to difference between $CongWin$ reduction values of the two connections, and the throughput values do not converge. The algorithm is therefore not fair or equal sharing.