Transport Layer (2) - Answers

A1)

	Flags = S	
	Seq. No. = 4676	
	Ack. No. = Blank	
	Flags = S A	
	Seq. No. = 3334	
<	Ack. No. = 4677	
	Flags = A	
	Seq. No. = 4677	
	Ack. No. = 3335	
	Data: 100 Bytes	$ \rightarrow $
	Flags = A	
	Seq. No. = 3335	
←	Ack. No. = 4777	
	Data: 40 Bytes	
Close	Flags = F A	
	Seq. No. = 4777	
	Ack. No. = 3375	;
	Flags = F A	Close
	Seq. No. = 3375	
←	Ack. No. = 4778	
	Flags = A	
	Seq. No. = 4778	
	Ack. No. = 3376	

A2) Reordering only by 1 packet would cause an unnecessary retransmission.

A3) There are $2^{32} = 4,294,967,296$ possible sequence numbers.

a) The sequence number does not increment by one with each segment. Rather, it increments by the number of bytes of data sent. So for this part, the size of the MSS is irrelevant -- the maximum size file that can be sent from A to B is simply the number of bytes representable by $2^{32} \approx 4$ Gbytes.

b) Total number of segments generated is $(2^32/536) = 8,012,999.66$ bytes get added as headers for each segment giving us $8012999 \times 66 = 528,857,934$ bytes of overhead. Total bytes that need to be transmitted = 4.824×10^9 bytes. Time required for transmission = $(4.824 \times 10^9 \times 8)/155 \times 10^6 = 249$ sec.