R3答案在課本3-9~3-10

R4答案在課本3-15

R14

a False. Piggyback is only for efficiency. If there's no data packet to be piggybacked to, then B will just send the acknowledgement packet.

捎帶只是為了效率。如果沒有數據包被捎帶，則B將發送確認數據包。

b False. It is the size of the receiver's buffer that's never changed. RcvWindow is the part of the receiver's buffer that's changing all the time depending on the processing capability at the receiver's side and the network traffic.

接收器緩衝區的大小從未改變。 RcvWindow是接收機緩衝區的一部分，它隨著接收方的處理能力和網絡流量的不斷變化。3-60~3-61

c False and True. The number of unacknowleged bytes that A sends cannot exceed the size of the receiver's window. But if it can't exceed the receiver's window, then it surely has no way to exceed the receiver's buffer as the window size is always less than or equal to the buffer size. On the other hand, for urgent messages, the sender CAN send it in even though the receiver's buffer is full.

發送的未識別字節數不能超過接收者窗口的大小。但如果它不能超過接收者的窗口，那麼當窗口大小始終小於或等於緩衝區大小時，它肯定無法超過接收者的緩衝區。另一方面，對於緊急消息，即使接收者的緩衝區已滿，發送方也可以發送它。

d False. For TCP, the sequence number is simply the byte-stream number of the first byte in the segment, and is not incremented, but assigned. There the first sequence number can be zero, and the next one can be 1000, the third 2000 and so on.

The sequence number of the subsequent segment depends on the number of 8-byte characters in the current segment.

後續段的序列號取決於當前段中8個字節的字符數。

For TCP, the sequence number is simply the byte-stream number of the first byte in the segment, and is not incremented, but assigned. There the first sequence number can be zero, and the next one can be 1000, the third 2000 and so on.  
對於TCP，序列號只是段中第一個字節的字節流號，不遞增，而是分配。第一個序列號可以為零，下一個可以是1000，第三個2000等等

e True. Every TCP segment has a current value of rwnd in the receive window.

每個TCP段在接收窗口中具有rwnd的當前值。

f False. Next\_RTT = alpha \* last\_estimated\_RTT + (1-alpha)\*newly\_collected\_RTT\_sample. In this case even though the last sampleRTT which is the newly\_collected\_RTT\_sample is 1sec, the next\_RTT still depends on alpha and last\_estimated\_RTT. Therefore, the next\_RTT is not necessarily greater than 1sec.

Next\_RTT = alpha \* last\_estimated\_RTT +（1-alpha）\* newly\_collected\_RTT\_sample。在這種情況下，即使最新的collectRTT（即new\_collected\_RTT\_sample）為1秒，next\_RTT仍然依賴於alpha和last\_estimated\_RTT。因此，next\_RTT不一定大於1秒。

**True**. EstimatedRTTis a weighted average of SampleRTT, the latter being the amount of time between when the segment is sent and when it is received. Since the TimeoutInterval should be greater than or equal to EstimatedRTT, it is safe to deduce that TimeoutInterval should be greater than or equal to the the value of which EstimatedRTT is an average of, or SampleRTT.

EstimatedRTT是SampleRTT的加權平均值，後者是段發送時間和收到時間之間的時間間隔。由於TimeoutInterval應大於或等於EstimatedRTT，因此可以安全地推斷出TimeoutInterval應大於或等於EstimatedRTT是或AverageRTT的平均值。

g True. The sequence number for a segment is the byte-stream number of the first byte in the segment, in this case, 38. The acknowledgement number is the sequence number of the next byte expected, or the first byte of the next segment, in this, since bytes 38, 39, 40, and 41 would be sent, the next byte segment expected is 42, which is the value placed as the acknowledgement number.

段的序列號是段中第一個字節的字節流號，在這種情況下為38.確認號是下一個字節的序列號，或下一個段的第一個字節，在此由於字節38,39,40和41將被發送，所以預期的下一個字節段是42，這是作為確認號碼的值。

R15 a) The first segment contains 110 − 90 = 20 bytes of data. b) TCP acknowledgments are cumulative and hence host B will acknowledge that it has received everything up to and excluding sequence number 90.

TCP確認是累積的，因此主機B將承認它已經收到

一切到排除序列號90。

R18

Ans: False. The threshold is set to one half of the current congestion window size.