Quiz 8: TCP and UDP

1. Which of these statements is correct?
   a. The window size at the receiving end of a TCP connection is communicated in
      one of the mandatory fields of the TCP header.
   b. The maximum segment size used on a TCP connection is communicated in one
      of the mandatory fields of the TCP header.
   c. The congestion window size is indicated in an optional field of the TCP header.
   d. The congestion window size is indicated in a mandatory field of the TCP
      header.

2. If the sender's window is as shown in the figure below, and if the advertised window
   size (receiver window size) is 1024 bytes, which segments can be sent? Assume that
   the cwnd is not a limiting factor.

<table>
<thead>
<tr>
<th>1</th>
<th>512</th>
<th>513</th>
<th>1024</th>
<th>1025</th>
<th>1536</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>sent but unacknowledged</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   a. 513-1024, 1025-1536 segments
   b. All three segments shown above are sent
   c. No segments can be sent
   d. 513-1024 segment only

3. What is the cwnd value when the ack 6024 segment is received?

   PSH 5000:6024 (1024)  
   cwnd=4096, ssthresh=4096
   ack 6024, win 1024
   PSH 6024: (1024)

   a. 4096
   b. 5120
   c. 4480
   d. none of the above
4. If RTO=6 ms, A=2 ms, D=1 ms before transmission of the first segment shown in the figure, what is the RTO after the ack is received?
   a. 6.125 ms
   b. 12.875 ms
   c. 6 ms
   d. 12 ms

5. Which of these figures represents a correct TCP transmission sequence? Each arrow represents a maximum-length TCP segment and MSS = 1024 bytes.
   a. Data flow I
   b. Data flow II
   c. Data flow III
   d. None of the above

6. What flow control mechanism is used in the UDP protocol?
   a. ON/OFF flow control
   b. Window based flow control
   c. Rate based flow control
   d. None of the rest
7. If the sequence number of a TCP segment is 1501, and the TCP segment payload is 400 bytes long, what is the acknowledgment number carried in the TCP header of this segment?
   a. 1901
   b. Unknown
   c. 1501
   d. 1900

8. If an advertised window for a TCP connection is 4000 bytes, MSS is 256 bytes, $cwnd$ is 2560 bytes, $ssthresh$ is 65K bytes, and a retransmission timeout occurs, what is the new value of $cwnd$?
   a. 512 bytes
   b. 128 bytes
   c. 2000 bytes
   d. 256 bytes