1.

Sol.

1. Destination: 34:c9:3d:1d:e1:e7 source: f0:33:e5:7a:cd:ed
2. Destination: 10.62.33.236 source: 10.0.6.202
3. TCP
4. 443. Because the ports number are always range in 0~1023, which is controlled by IANA(Internet Assigned Numbers Authority)
5. 3533. Because the destination ports are range in 1024~49151.

2.

Sol.

RTT \* Bandwidth = 100ms \* 1Gbps = 100Mb = 12.8Mb

Advertised Window = = 24bits

Maximum segment lifetime \* Bandwidth = 30s \* 1Gbps = 30Gb = 3.75GB

Sequence Num = = 32bits

3.

Sol.

1. [1, 6] & [23, 26].
2. [6, 16] & [17, 22].
3. By a triple duplicate ACK.
4. By a timeout.
5. 32.
6. 21.
7. 14.
8. In 7th transmission round.
9. Congestion window size = 7; Ssthresh = 4.
10. Ssthresh = 21. Congestion window size = 1.
11. 17: 1; 18: 2; 19: 4; 20: 8; 21: 16; 22: 21.

4.

Sol.

1. 1MB / 1KB = 1024. = 10. So it would take 10 RTTs.
2. For the first 10 RTTs, we can send 1KB+2KB+…+512KB=1023KB. But because the receive windows is 1MB. Thus, we just can send 1MB at one time after the first 10 RTTs.  
   When in 20 RTTs, we can send 11263KB which is just over 10MB=10240KB. So we need 20 RTTs.
3. RTT=100ms, so the time it took to send the file is 20\*50ms=2s.  
   The effective throughput is given by 10MB/2s = 5MB/s = 40Mbps.   
   Percentage of bandwidth utilized is 40Mbps/1Gbps=4%