中 山 大 学 软 件 学 院 **2012** 级 软 件 工 程 专 业 (2014 学年秋季学期)

《 **SE-301** 计 算 机 网 络 》 期 末 试 题 答 案 **(B)**

1. Use cookies. Check textbook for answers.

2.

   a)
   Each transmitter sends one window's worth of data each RTT. The window size increases linearly from W/2 to W. So average length of transmit window .

   $$\frac{1}{2}\left(W + \frac{W}{2}\right) = \frac{3}{4}W \Rightarrow \overline{R} = \frac{3}{4} \cdot \frac{W}{RTT}$$

   b)
   In each period of the sawtooth, one packet is lost, and the transmitter sends 1+W/2 windows of packets; and the average window size is 3/4*W. Therefore, 1 packet is lost for every

   $$\frac{3}{4}W\left(1 + \frac{W}{2}\right)$$

   that are transmitted.

   c)

   Rearrange (c) to get

   $$W = \sqrt{\frac{8}{3} \cdot \frac{1}{\sqrt{L}}} \ \textit{packets, and substitute W into (b) to get:}$$

   $$\overline{R} \approx \frac{3}{4}\sqrt{\frac{8}{3}} \cdot \frac{1}{\sqrt{L}} \frac{1}{RTT} \cdot P = \frac{\frac{3}{4}\sqrt{\frac{8}{3}}}{\sqrt{L} \cdot RTT} P \approx \frac{1.22P}{\sqrt{L} \cdot RTT}$$

3. Check ppt Network layer 4-93 for details.

4. NAT:
    (a)

1) The source IP address,
   2) TCP source port number.
   The change in the value of these two parameters implies that the following two fields also need to be changed:
   3) IP checksum
   4) TCP checksum

 (b)
   P2:   S=138.76.29.7, 5001   D=128.110.40.186, 80
   P3:   S=128.110.40.186, 80   D=138.76.29.7, 5001
   P4:   S=128.110.40.186, 80   D=10.0.0.1, 3345

5. Checksums have a greater probability of undetected errors than do CRCs. That is, CRCs are better at detecting errors and will result in less undetected errors than checksums. CRCs are easily be computed in hardware, but not very easily in software. Checksums can be computed in software much faster than can CRCs.

6. Check textbook for answers.

7. Any reasonable answer which contains the following terminologies: DNS, TCP/UDP, IP, MAC **in network and link layers** is acceptable.