中山大学软件学院 2010 级软件工程专业(2012 学年秋季学期)

《SE-301 计算机网络》期末试题答案(B)

1. (10 points)
   Call setup required. Dedicated resources, no sharing. Circuit-like performance.
   0.5+1000 k * 8/(500 k/8) = 128.5 s

2. (14 points)
   a) 250 kbps. (3 points)
   b) 4000 km / (2 * 10^8 m/s) = 0.00004 s. no. no. (6 points)
   c) 2000000 *8 b/200kbps + 0.00004 s = 80.00004 s. (5 points)

3. (12 points)
   a. RTT1+...+RTTn+2RTT0+6*2RTT0
      因为使用 6 个 TCP 连接传 6 个 object
   b. RTT1+...+RTTn+2RTT0+2*2RTT0
      5 个并行连接传 6 个 object，需要传两次
   c. RTT1+...+RTTn+2RTT0+RTT0
      Persistent HTTP：subsequent HTTP messages between same client/server sent over open connection

4. (8 points) a) true b) false c) true d) true

5. (12 points)
   a) It takes 1 RTT to increase CongWin to 2 MSS; 2 RTTs to increase to 3 MSS; 3 RTTs to increase to 4 MSS; 4 RTTs to increase to 5 MSS; and 5 RTTs to increase to 6 MSS.
   b) In the first RTT 1 MSS was sent; in the second RTT 2 MSS was sent; in the third RTT 3 MSS was sent; in the forth RTT 4 MSS was sent; in the fifth RTT, 5 MSS was sent. Thus, up to time 5 RTT, 1+2+3+4+5 = 15 MSS were sent (and acknowledged). Thus, once can say that the average throughput up to time 5 RTT was (15 MSS)/(5RTT) = 3 MSS/RTT.

6. (10 points)

Destination address range	Interfaces	The number of address
00000000 through 00111111	0	64
01000000 through 01011111	1	32
01000000 through 01111111	2	64+32=96
10000000 through 10111111	2	
11000000 through 11111111	3	64

7. (8 points) R=010，过程略。

8. (12 points)

The maximum size of data field in each fragment = 480 (20 bytes IP header). Thus the number of required fragments $= \left\lceil \frac{3000-20}{480} \right\rceil = 7$

Each fragment will have Identification number 422. Each fragment except the last one will be of size 500 bytes (including IP header). The last datagram will be of size 120 bytes (including IP header). The offsets of the 7 fragments will be 0, 60, 120, 180, 240, 300, 360. Each of the first 6 fragments will have flag=1; the last fragment will have flag=0.

9. (14 points)

a)表格略， D(y)=6, D(z) = 7, D(u) = 8, D(v) = 5. (8 points)

b)简述 OSPF 协议要点，参考课件。(6 points)