

National University of Computer and Emerging Sciences, Lahore Campus
Quiz3 [BS(CS): Section A] Fall 2024

Computer Networks (Code: CS3001)

Date: October 17, 2024

Total Marks: 15

Duration: 20 -Minutes

Name ----- Roll #----- Section -----

Instructions: Attempt all questions on this sheet. You can make use of rough sheets (do not attach to this sheet).

Q1: The table below shows various transmission rounds (i.e., RTTs 1 to 13) and size of congestion window (i.e., cwnd as MSS) at the start of each RTT of the TCP congestion control algorithm. Assume that initial value of ss_thresh is equal to 16. Refer to this table, please answer the following questions: **[1.5x 6 = 9 Marks] (CLO 2)**

RTT	1	2	3	4	5	6	7	8	9	10	11	12	13
Congestion window	2	4	8	16	1	2	4	8	9	10	11	12	9 or 6

i. The data in table depicts TCP Tahoe or TCP Reno congestion control approach? Justify your answer.

Answer: **TCP Reno as it goes to Fast Recovery phase after 3 duplicate ACKs (refer to RTT 13)**

ii. What happened after RTT 4? What is the value of ss_thresh after RTT 4?

Answer: **Time-Out occurred, ss_thresh will become half i.e., 8.**

iii. What happened after RTT 12? What is the value of ss_thresh after RTT 12?

Answer: **3 duplicate ACKs received, ss_thresh will become half i.e., 6.**

iv. Which state/phase is the TCP in at transmission round (RTT) 13.

Answer: **Fast Recovery**

v. Which state/phase is the TCP in between transmission rounds (RTTs) 5 to 8.

Answer: **Slow Start**

vi. Which state/phase is the TCP in between transmission rounds (RTTs) 9 to 12.

Answer: **Congestion Avoidance**

Q2: A UDP receiver has received the following data bits and checksum bits. **[6 Marks] (CLO 2)**

Data bits: 0110 0110 0110 0000 0101 0101 0101 0101 1000 1111 0000 1100

Checksum bits: 1011 0101 0011 1101

How will the receiver verify if the data received is valid or in error? (Show detailed step by step working.)

Start writing your Answer for Q2 on the backside of this sheet.

Q2 Solution: 0110 0110 0110 0000 (first & second byte of Data bits)

0101 0101 0101 0101 (third & fourth byte of Data bits)

1011 1011 1011 0101 (sum)

1000 1111 0000 1100 (fifth & sixth byte of Data bits)

0
1 0100 1010 1100 0001 (sum)

└───────────▶
Wraparound 1 (carry over wrapped around)

0100 1010 1100 0010 (sum, i.e. final sum of all 6 bytes of data with carry over wrapped around)

1011 0101 0011 1101 (received checksum)

1111 1111 1111 1111 (sum, since all 1s, no error detected; if any 0 in answer, answer by student is incorrect)

Or if some student computes the checksum again, it should be equal to the given checksum in the question