National University of Computer and Emerging Sciences, Lahore Campus

Quiz ……3 [BS(CS): Section D] Fall 2022

Computer Networks (Code: CS3001) **Quiz Date: October 24, 2022**

Total Marks: 10 **Duration: 15 -Minutes**

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

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

Q1: Encircle the correct option(s): **(3 Marks)** **CLO 1**

(i) Destination port number field in TCP segment consists of _____ bits.

A. 8 **B. 16** C. 4 D. 1

(ii) Which of the following is a pipelined protocol?

A. rdt 2.0 B. rdt 3.0 C. rdt 2.1 **D. None of these**

(iii) When out-of-order segment arrives, TCP receiver immediately ----------.

A. discards it B. sends an ACK **C. sends duplicate ACK**

Q2: Station A needs to send a message consisting of 9 packets (numbered as 1 to 9) to station B using a sliding window (window size 3) and Go-Back-N error control strategy. All packets are ready and immediately available for transmission. If every 5th transmitted packet gets lost (ACKs from B never get lost), then how many packets A will transmit for sending entire message to B? Moreover, write packet numbers which get lost during this process. Show necessary working, **(7 Marks)** **CLO 4**

Start writing your Answers to Q2 onward from here and then use backside of this sheet.

Q2 Solution:

Let packets are numbered as 1 to 9.

Window size = 3

Every 5th packet gets dropped

Step 1 view	3rd packet (3)	2nd packet (number 2)	1st packet (number 1)
Step 2 view (after ACK for pkt # 1)	4th packet (number 4)	3rd packet (number 3)	2nd packet (number 2)
Step 3 view (after ACK for pkt # 2)	5th packet (number 5)	4th packet (number 4)	3rd packet (number 3)
Step 4 view (after ACK for pkt # 3)	6th packet (number 6)	5th packet (number 5)	4th packet (number 4)
Step 5 view (after ACK for pkt # 4)	7th packet (number 7)	6th packet (number 6)	5th packet (number 5)
Step 6 view (After loss of 5th - pkt # 5)	10th packet (number 7)	9th packet (number 6)	8th packet (number 5)

Step 7 view (after ACK for pkt # 5)	11th packet (number 8)	10th packet (number 7)	9th packet (number 6)
Step 8 view (after ACK for pkt # 6)	12th packet (number 9)	11th packet (number 8)	10th packet (number 7)
Step 9 view (After loss of 10th - pkt # 7)	15th packet (number 9)	14th packet (number 8)	13th packet (number 7)
Step 10 view (after ACK for pkt # 7)		15th packet (number 9)	14th packet (number 8)
Step 11 view (after ACK for pkt # 8)			15th packet (number 9)
Step 12 view (After loss of 15th - pkt # 9)			16th packet (number 9)
Step 13 view (after ACK for pkt # 9)			

Total number of packets sent: 16

Packet numbers which get lost: 5 (5th packet), 7 (10th packet) and 9 (15th packet)

Note: Kindly verify that answers are provided after performing necessary steps (not necessarily as mentioned above, concept should be clear).

If just answers are given, then give maximum 4 marks for all correct answers (1 for each). 1 mark for each correctly marked packet number.