National University of Computer and Emerging Sciences, Lahore Campus

Quiz ……3 [BS(CS): Section E] Fall 2023

Computer Networks (Code: CS3001) **Quiz Date: October 30, 2023**

Total Marks: 15 **Duration: 20 -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) (2 Marks):

(i) Urg data pointer 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. All of these **D. None of these**

Q2: Host A and B are communicating over a TCP connection, and Host B has already received from A all bytes up through byte 126. Suppose Host A then sends two segments to Host B back-to-back. The first and second segments contain 80 and 40 bytes of data, respectively. In the first segment, the sequence number is 127, the source port number is 302, and the destination port number is 80. Host B sends an acknowledgment whenever it receives a segment from Host A. **(9 Marks)**

a. What is the sequence number and destination port number in the second segment sent from Host A to B?
b. If the first segment arrives before the second segment, then, in the acknowledgment of the first arriving segment by host B to A, what will be the acknowledgment number and the destination port number?
c. If the second segment arrives before the first segment, then, in the acknowledgment of this received segment, what will be the acknowledgment number and source port number?

Q3: Suppose that TCP's current estimated values for the round-trip time (estimated RTT) and deviation in the RTT (Dev RTT) are 200 msec and 8 msec, respectively. Suppose that the next measured value of the RTT is 200 msec. You are required to compute TCP's new value of estimated RTT, Dev RTT, and the TCP timeout interval after the measured RTT values is obtained. Use the values of $\alpha = 0.125$ and $\beta = 0.25$? **(4 Marks)**

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

Q2 Solution:

a. Sequence number in second segment = Sequence number in first segment + 80 =127+ 80 = 207

Destination port number= 80

b. ACK number= 207
Destination port number= 302

c. ACK number= 127
Destination port number= 80

Q3 Solution:

RTT estimate is made as follows after measured RTT:

EstimatedRTT = α * *SampleRTT+ (1- α) * EstimatedRTT*

EstimatedRTT = 0.125 * 200 + (1-0.125) * 200

=0.125* 200 + 0.875 * 200 =25 + 175 = 200 msec

*DevRTT = β * | SampleRTT- EstimatedRTT|+(1- β)* DevRTT*

=0.25 * |200-200| + (1-0.25) *8

=0.25 * 0 + 0.75 * 8

=0 + 6 = 6 msecs

Timeout Interval = EstimatedRTT +4 DevRTT*

= 200 + 4 * 6 = 224

=224 msecs