National University of Computer and Emerging Sciences, Lahore Campus

	Course Name:	Computer Networks	Course Code:	CS 3001
	Program:	BS (Computer Science)	Semester:	Spring 2025
	Duration:	15 minutes	Total Marks:	15
	Paper Date:	25-March-2025	Section	6A
	Exam Type:	Quiz 3 - Chapter 3	Page(s):	2

Student Name **Roll No.** **Section:**

Q1. <u>Encircle the correct option:</u> **[5 marks] [CLO 3]**

1. When out-of-order segment arrives, TCP receiver immediately ----------.
   a) Discards it
   b) Sends a duplicate ACK
   c) Sends an ACK
   d) None of the above

2. User datagram protocol is called connectionless because:
   a) All UDP packets are treated independently by transport layer.
   b) No connection is made before the transfer of actual data
   c) a & b
   d) None
3. Transport layer aggregates data from different applications into a single stream before passing it to
   a) Data link layer
   b) Physical layer
   c) Network layer
   d) Application layer

True/False:

i. TCP is a connectionless protocol. [T / F]
ii. Checksum with wraparound is used for **error correction** [T / F]

Question 2: **[Marks 10] [CLO 3]**

A network engineer is monitoring a TCP connection between a client and a remote server. To ensure smooth data transfer, TCP adjusts its timeout interval based on real-time network conditions. At the moment, TCP's Estimated RTT is 210 milliseconds, and the Deviation in RTT (Dev RTT) is 49 milliseconds. As new data packets are transmitted, the engineer records two new RTT measurements: 280 ms and 210 ms. Since TCP dynamically updates its timeout values to adapt to changing network conditions, the engineer needs to recalculate the following after each new RTT measurement:

1. The updated Estimated RTT

2. The updated Deviation RTT (Dev RTT)

3. The new TCP Timeout Interval

Using $\alpha = 0.125$ and $\beta = 0.25$, determine how these values change after each measurement. Consider how these adjustments impact the connection's reliability and responsiveness.