National University of Computer and Emerging Sciences, Lahore Campus
Quiz ……6 [BS(CS): Section D] Fall 2023

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

Total Marks: 15   **Duration: 20 -Minutes**

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

Q1: Consider the Cyclic Redundancy Check (CRC) algorithm. Suppose that the 4-bit generator (G) is 1001, and the receiver has received the data including CRC bits as **10011111011**. You are required to find (showing all steps) on the receiver side whether there is an error on received data or not and justify your answer as well.

Q2: Assume that there are 4 active nodes, each of which has an infinite supply of frames they want to transmit, and these frames have a constant size of L bits. If two or more frames collide, then all nodes will detect the collision. Given the probability of transmission p = 0.25, what is the maximum efficiency of Slotted Aloha?

Answer Q1: If we divide **10011111011 by** 1001, we get 101 as a remainder.
Yes, receiver finds that there is an error in received data because remainder (R) is non zero.

Answer Q2: The maximum efficiency of Slotted Aloha is calculated as follows:
For a given p = 0.25
Max efficiency = Np (1 - p)^(N - 1)
                         = 4 * 0.25 * (1 - 0.25)^(4 - 1)
                         = 1 * (0.75) ^3 = 0.421875 or 42.2% efficiency.