BRAC UNIVERSITY
Department of Computer Science and Engineering

Examination: Quiz 06 **Semester: Summer 2023**
Duration: 30 Minutes **Full Marks: 15**

CSE320: Data Communications

Name:	**ID:**	**Section:**

Answer the following questions on the question paper

Question 01: CO5 [5 + 5]

a) Given the dataword $x^9 + x^5 + x^3 + x^2 + 1$ and the divisor 10111, **show** the generation of the CRC codeword at the sender side **using binary division**.

b) After sending the codeword to the receiver, suppose the **second bit from MSB (left) to LSB (right)** is corrupted or inverted during transmission. **Show** the calculation at the receiver side using **polynomial division. Comment** if CRC can detect the error or not.

Question 02: CO5 [5]

a) For **how** many changing bits can we successfully **detect and correct** errors using this 2B/6B scheme? Show the calculation.

Dataword	Codeword
00	101101
01	110100
10	000010
11	011000

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Question 01: CO5 [4 + 4]

a) Assume a packet is made only of five decimal$_{(base\ 10)}$ words: **7, 8, 5, 9, 21**. Represent the data in 4 bits binary sequence. **Show** the checksum at the sender side using 4 bits binary representation.
b) Now change the second data to 9 and third data to 6. **Show** the calculation at the receiver side. **Comment** on the error detection.

Question 02: CO5 [3 + 4]

a) Assume a packet is made only of four 16-bit words $(56E)_{16}$, $(DB2)_{16}$, $(94)_{16}$, and $(DD)_{16}$. **Show** the checksum at the sender.
b) If the second data item is changed to $(C0)_{16}$ and the last data item is changed to $(E1)_{16}$ during transmission, check if the receiver can detect any error or not.

(Hint: The given words are in hexa-decimal value, that means, each digit can be represented by 4 bits. Remember hexadecimal values range from 0000 – FFFF).