Assignment - 04
Total Marks: 30

1. The 2-bit datawords are converted to the following 5-bit codewords. For how many bits can we successfully detect and correct errors using this scheme?

Dataword	Codeword
00	00000
01	01011
10	10101
11	11110

   The receiver received the codeword 10001 that contains 1 bit error. Determine if the original dataword can be retrieved from it or not.

2. Suppose you want to transmit the message 11011011 and protect it from errors using the CRC generator polynomial $x^3 + 1$. Using **polynomial division**, show the message that should be transmitted.

   Later, corrupt the left-most third bit of the transmitted message and show whether the error is detected by the receiver or not using the **CRC** technique.

3. Assume a packet is made only of four **8-bit words** $(125)_{10}$, $(20)_{10}$, $(220)_{10}$ and $(100)_{10}$.

   I. Show the checksum at the sender.
   II. If the second data item is changed to $(45)_{10}$ and the third data item is changed to $(195)_{10}$ during transmission, check if any error can be detected at the receiver. Explain your findings.