United International University (UIU)

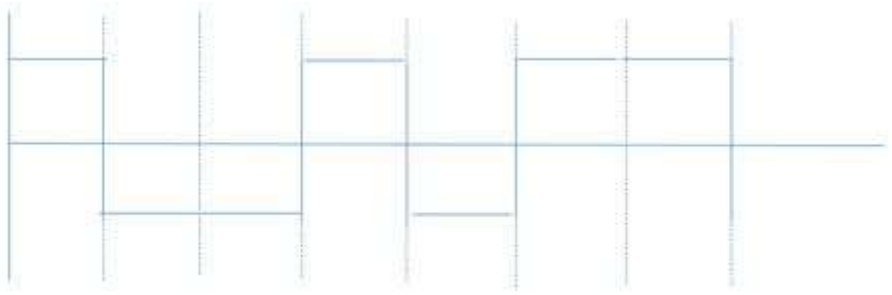
Dept. of Computer Science & Engineering (CSE)

Final Exam Trimester: Summer - 2020

Course Code: CSE 315 Course Title: Data communications

Total Marks: **25** Duration: 90 Minutes

Figures are in the right-hand margin indicating full marks.

Q1 **(a)**	The following signal was received using the NRZ-I Scheme. (Initially, the value of the signal was positive) The High peak represents +5v and the low peak represents -5V.  Figure 1: Received Signal Then the signal was re-transmitted using the AMI scheme. Draw the retransmitted Digital Signal.	**[3]**
(b)	While Studying data communication, Akib noticed that the line coding scheme that provides self-synchronization also avoids DC component Problems. Name the line coding techniques that meet the above criteria and state the reason as to why they provide self-synchronization and avoid DC Component problems?.	**[3]**
Q2 **(a)**	The sender and receiver are using Checksum Error Detection Technique while transferring data. Now at a certain point in the time, the receiver received the following bitstream, find out if there are any errors at the receiver end. 1101 1100 1001 1100 1110 1101 1100 1010 1001	**[2]**
(b)	The sender and receiver are using the CRC technique for error detection. Given the message polynomial $M(X) = X^9 + X^8 + X + 1$ and generator polynomial, $P(X) = X^3 + X^2 + X$. find the CRC Polynomial or C(X). How many bits of error can be detected using this CRC Error Detection Technique?	**[2+1]**
Q3 **(a)**	What role does carrier frequency play in converting a digital signal to an analog signal?	**[2]**

(b)	What are the techniques available for converting an analog signal into another analog signal? Why do we convert an analog signal into another analog signal?	**[2]**
(c)	What is Quadrature Amplitude Modulation? What are the benefits of this technique over simple ASK, FSK, and PSK?	**[2]**
Q4 **(a)**	Suppose, you have two fair dice with six sides each. What is the information you will get when two dices are rolled and the sum of the numbers on the two dice is 7?	**[2]**
(b)	Do you think WIFI and IEEE 802.11 standards are the same thing? Justify your answer in short.	**[2]**
(c)	Which kind of cell shape will you prefer while designing a cellular network and why?	**[2]**
(d)	Is it possible to perform FDM on digital signals? Justify your answers in short.	**[2]**