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| **Department of Electrical Engineering**  **Final – Term Assignment Spring 2020**  **Date: 22/06/2020**  **Course Details** | | | |
| **Course Title:** | Computer Communication Network | **Module:** | 06 |
| **Instructor:** |  | **Total Marks:** | 50 |
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**Student Details**

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| Q1. | (a) | 1. An NRZ-I signal has a data rate of 100 Kbps. Using the following Figure, calculate the value of the normalized energy (P) for frequencies at 0 Hz, 50 KHz, and 100 KHz. 2. What is the Nyquist sampling rate for each of the following signals?   a. A low-pass signal with bandwidth of 200 KHz?  b. A band-pass signal with bandwidth of 200 KHz if the lowest frequency is 100 KHz?   1. We have sampled a low-pass signal with a bandwidth of 200 KHz using 1024 levels of quantization.   a. Calculate the bit rate of the digitized signal.  b. Calculate the SNRdB for this signal.  c. Calculate the PCM bandwidth of this signal.   1. What is the maximum data rate of a channel with a bandwidth of 200 KHz if we use four levels of digital signaling. | Marks 20 |
| CLO 1 |
| Q2. | (a) | Draw the graph of the NRZ-L, NRZ-I, Manchester and differential Manchester scheme using each of the following data streams  a. 01010101  b. 00110011 | Marks 16 |
| CLO 1 |
| Q3. | (a) | 1. A TV channel has a bandwidth of 6 MHz. If we send a digital signal using one channel, what are the data rates if we use one harmonic, three harmonics, and five harmonics? 2. A signal travels from point A to point B. At point A, the signal power is 100 W. At point B, the power is 90 W. What is the attenuation in decibels? 3. The attenuation of a signal is -10 dB. What is the final signal power if it was originally 5 W? 4. A signal has passed through three cascaded amplifiers, each with a 4 dB gain. What is the total gain? How much is the signal amplified? 5. If the bandwidth of the channel is 5 Kbps, how long does it take to send a frame of 100,000 bits out of this device? 6. The light of the sun takes approximately eight minutes to reach the earth. What is the distance between the sun and the earth? | Marks 12 |
| CLO 1 |
| (b) | A signal has eight data levels with a pulse duration of 2 ms. Calculate the pulse rate and bit rate. | Marks 02 |
| CLO 1 |