JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -1 EXAMINATION- FEB-2023

COURSE CODE(CREDITS): 18B11EC611 (3)   MAX. MARKS: 15

COURSE NAME: Wireless and data communication

COURSE INSTRUCTORS: Er. Munish Sood   MAX. TIME: 1 Hour

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1) What are the advantages and disadvantages of wireless communication? What is the need to use line coding schemes during digital transmission of data?   **(3) CO-3**

Q2) The Polar NRZ-L line encoding for the data sequence 01001110 is as shown in the following figure. Encode 01001110 using   **(3) CO-1**
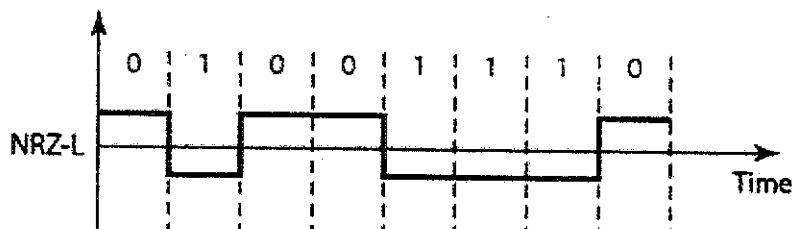
a) Polar RZ scheme.
b) Polar Bi-phase Differential Manchester scheme.
c) Bipolar pseudo ternary scheme.

Q3) Assume four stations S_1, S_2, S_3 and S_4 use CDMA (walsh codes) to encode the data bits $D_1 = -1$, $D_2 = -1$, $D_3 = 0$ and $D_4 = 1$. Give the resultant channel sequence. Decode the resultant data bit for station S_2.   **(3) CO-1**

Q4) For a mobile receiver operating at a carrier frequency of 850 MHz and moving at a constant velocity of 100 km/h, compute the level-crossing rate and average fade duration if $\rho = 1$.   **(3) CO-3**

Q5) Assume that a bit error occurs whenever any portion of a bit encounters a fade for which $\rho < 0.1$. For a given maximum Doppler frequency of 10 Hz.   **(3) CO-3**

a) What is the average fade duration for threshold levels $\rho = 0.4$?
b) What is the average number of bit errors per second for the given data rate of 100 bps?