Course Name:	Data Communication		Course Code:	COE 3201
Semester:	Spring 2023-24		Term:	Mid
Total Marks:	30		Submission Date:	7-03-2024

Course Outcome Mapping with Questions

Item	COs	POIs	K	P	A	Marks	Obtained Marks
Q1	CO4	P.a.1.C3	K5	P1		15	
Q2	CO4	P.a.1.C3	K5	P2		15	
					Total:	30	

Student Information:

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Section: F	Department: CSE

1. Your ID = AB-CDEFG-H. Convert the letters C and G into 8-bit ASCII code using ASCII chart, where the 8-th bit can be considered as zero. Draw the graph of the digital bit steam for the following scheme:
  I.   Unipolar NRZ and Unipolar RZ
  II.   Polar RZ, Polar NRZ-L, Polar NRZ-I (Last Signal level Positive)
  III. Bipolar Manchester ('0' is low to high & '1' is high to low) and Bipolar Differential Manchester (Last Signal level Negative)
  IV.   Bipolar AMI and Bipolar Pseudoternary (Last non-zero signal Level is Positive for both schemes)
  V.   Multiline Transmission (MLT-3), given that the last voltage level is zero and last non-zero level is positive.

2. Find the 8-bit data stream for each case depicted in figure 1. Assume, that the last signal level was negative.
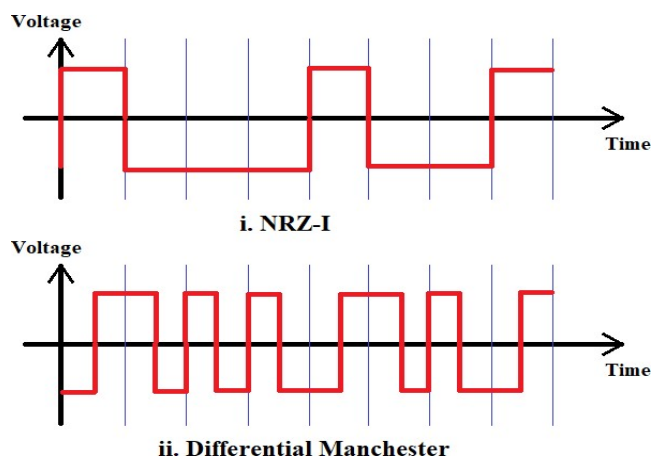

i. NRZ-I

ii. Differential Manchester

Figure: 1

ID = 22-46444-1
   A B-C D E F G -H

Here,

   C = 4
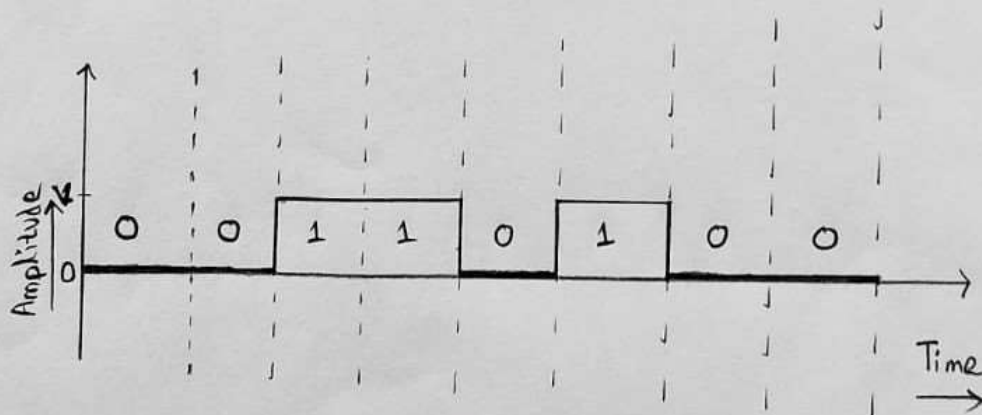   G = 4

ASCII code for 4 is,

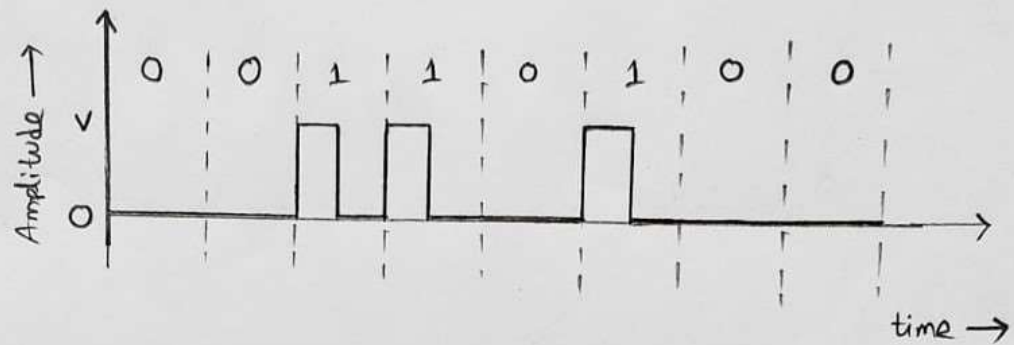   Bit positions   8 7 6 5 4 3 2 1

          4 ⟶   0 0 1 1 0 1 0 0

Here my C and G values are same. So, I don't need to draw
the digital signals separate for C and separate for G.
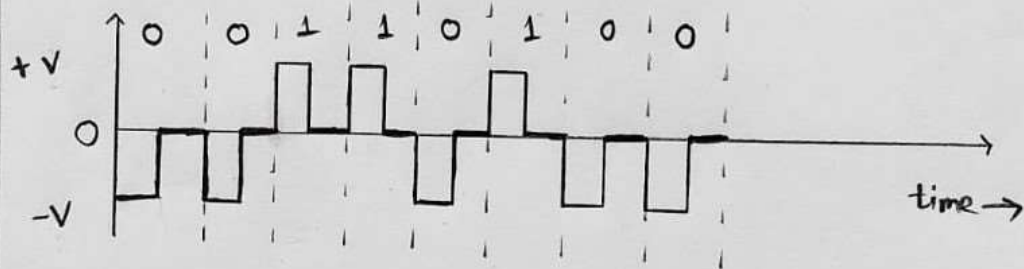I will draw the all signals for one time.
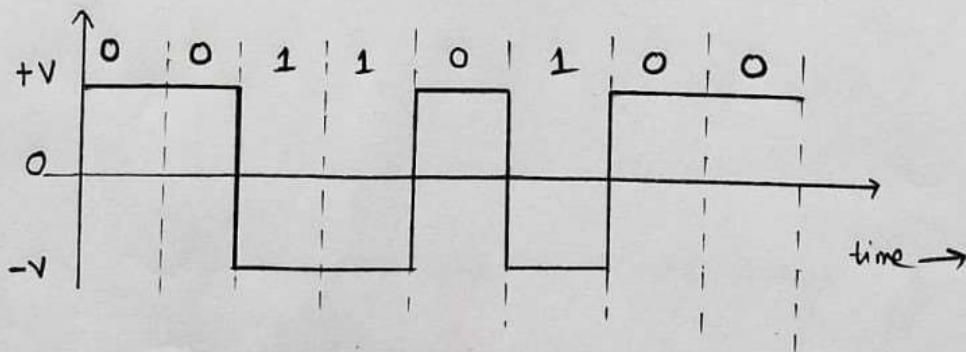
(I) Underline NRZ:

Unipolar RZ:

Amplitude →

V

O

0 | 0 | 1 | 1 | 0 | 1 | 0 | 0

time →

(II) Polar RZ: 1 → Positive, 0 → Negative

+ V

O

-V

0 | 0 | 1 | 1 | 0 | 1 | 0 | 0

time →

Polar NRZ-L: 0 → Positive, 1 → Negative

+V

O

-V

0 | 0 | 1 | 1 | 0 | 1 | 0 | 0

time →

Polar NRZ-I: Last signal level positive.

0 → Positive,   1 → Negative

bit 1 → change
bit 0 → No change
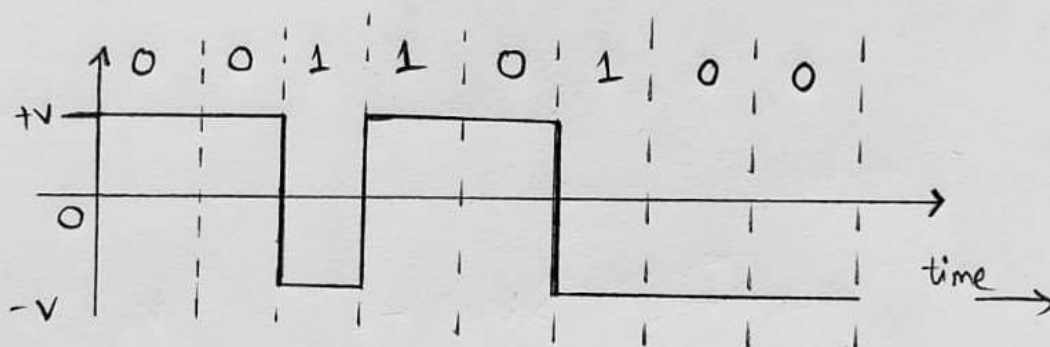
(III) Bipolar Manchester: 0 → ⎍ , 1 → ⎎
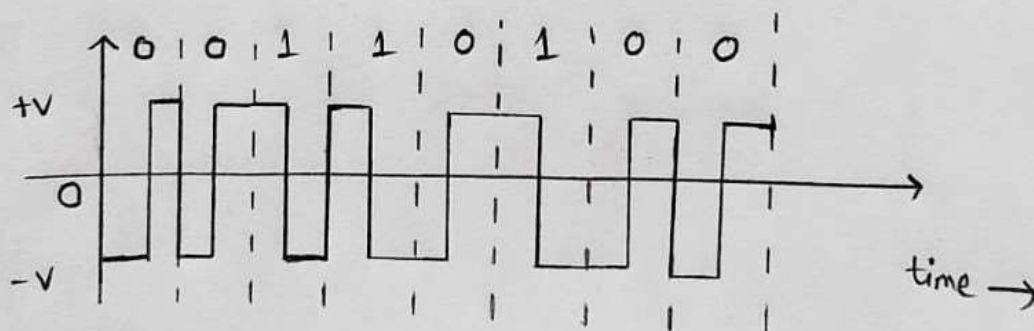
Bipolar differential manchester: Last signal Level negative.

bit 1 → no change   0 → negative
bit 0 → change   1 → positive

0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |

+v

0

−v

time
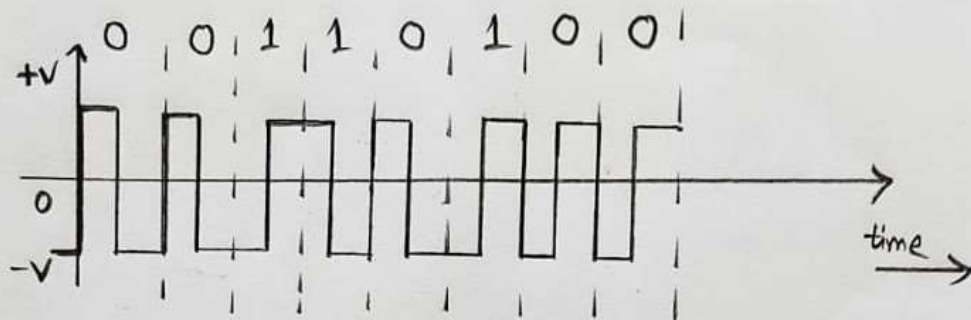
(IV) Bipolar AMI: Last non zero signal level is positive.

0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |

+v

0

−v

time →

Bipolar Pseudoternary: Last non zero signal level is positive.

0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |

+v

0

−V
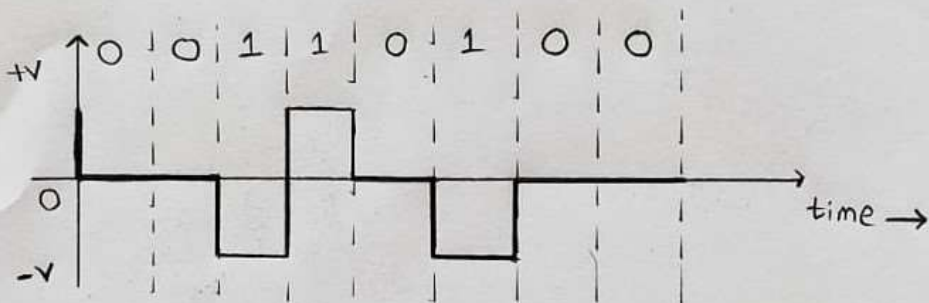
time →
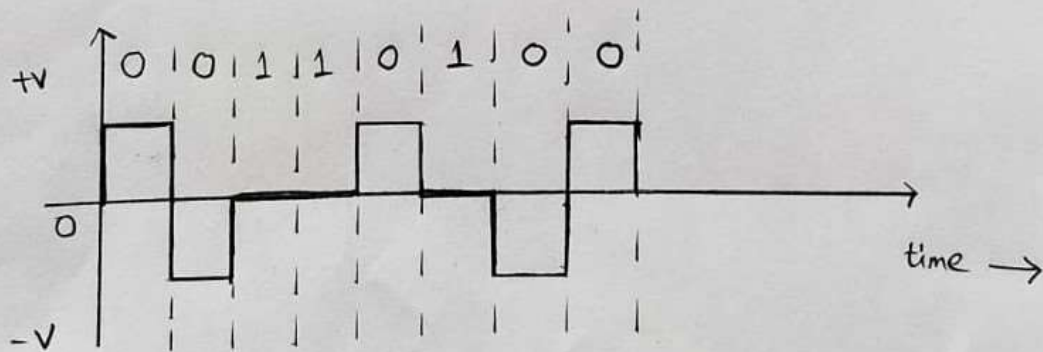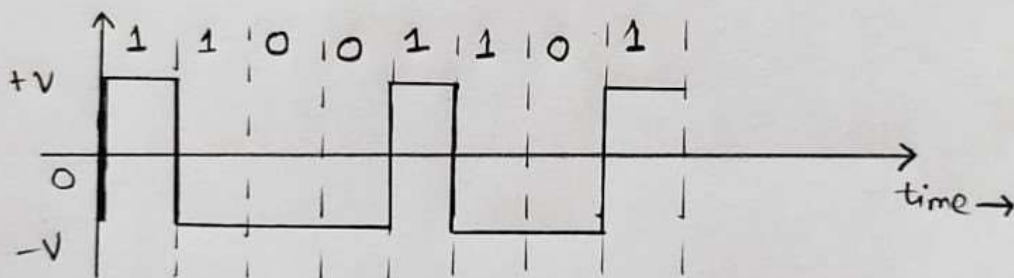
(V) Multiline Transmission (MLT-3): Last voltage level is zero and last non-zero level is positive.
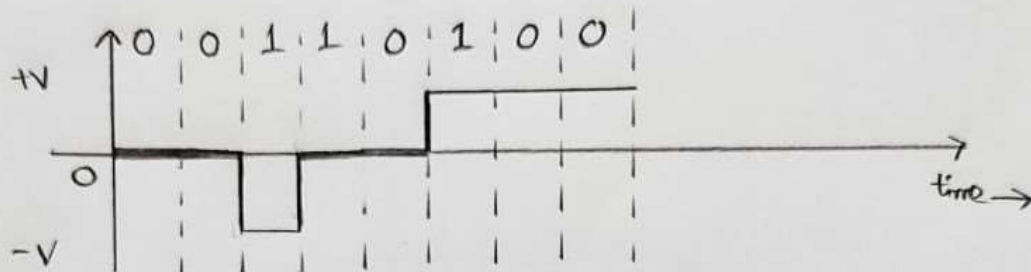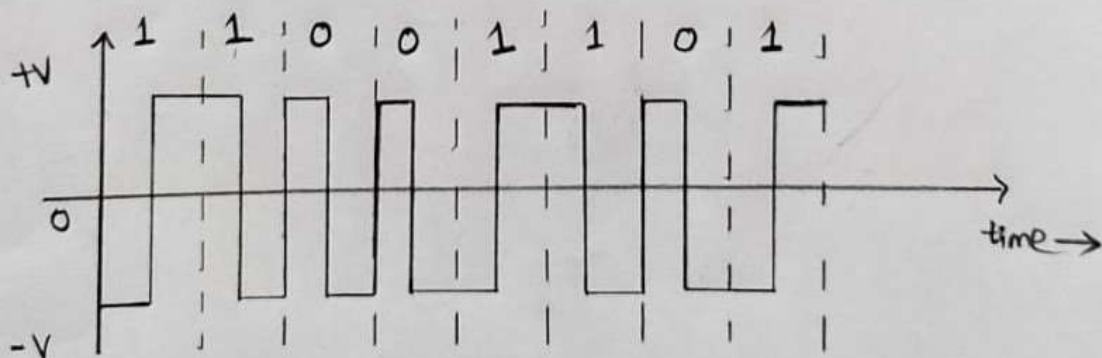
Assume that last signal level was negative.

(i) NRZ-I (1 1 0 0 1 1 0 1)

(ii) Differential Manchester (1 1 0 0 1 1 0 1)