American International University- Bangladesh (AIUB)
Faculty of Engineering

Course Name:	Data Communication		Course Code:	COE 3201
Semester:	Spring 2022-23		Term:	Mid
Total Marks:	30		Submission Date:	4-03-2023

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:	J	Department:	CSE

1. Your ID = AB-CDEFG-H. Convert the letter G into 8-bit ASCII code, where the 8-th bit can be considered as a zero. Illustrate 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
   III. Bipolar Manchester ('0' is low to high & '1' is high to low) and Bipolar Differential Manchester
   IV. Bipolar AMI and Bipolar Pseudoternary
   V. Multiline Transmission (MLT-3), given that the last voltage level is zero and last non-zero level is positive

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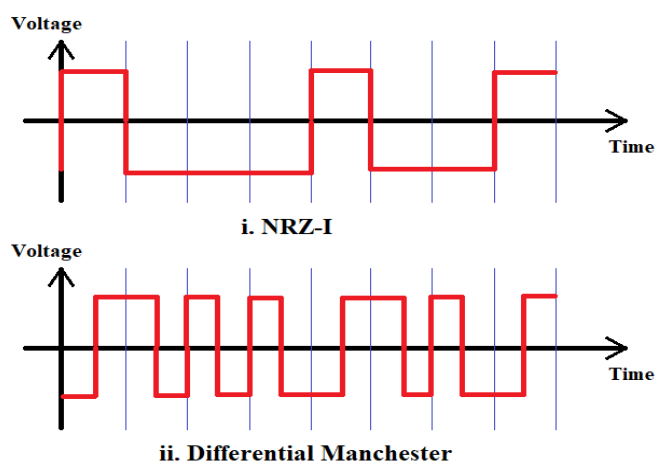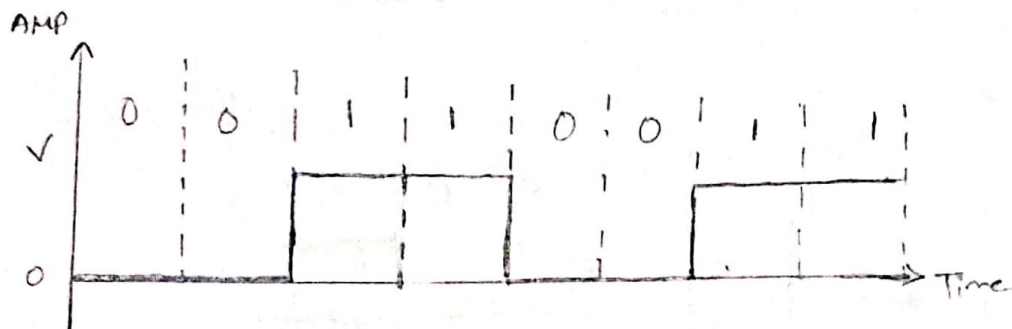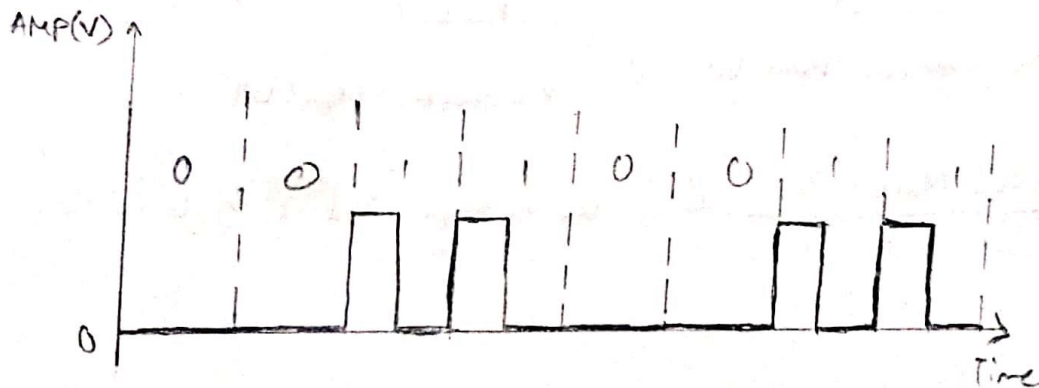

i. NRZ-I

ii. Differential Manchester

Figure: 1

Ans to Q. NO - 1

ID → 21-44543-1

AB- CDEFG - H

Here, $G = 3$ (ASCII character) $= 33$ (Hex)

$\qquad = 00110011$ (binary)

1) Underline **Unipolar NRZ:**

Unipolar RZ:

II) **Polar - RZ:**

Polar NRZ-L:

AMP

+V

0   0   1   1   1   0   0   1   1   1

0

-V

→ Time

Polar NRZ-I:

AMP +V

0   0   1   1   1   0   0   1   1   1

0

-V

→ Time
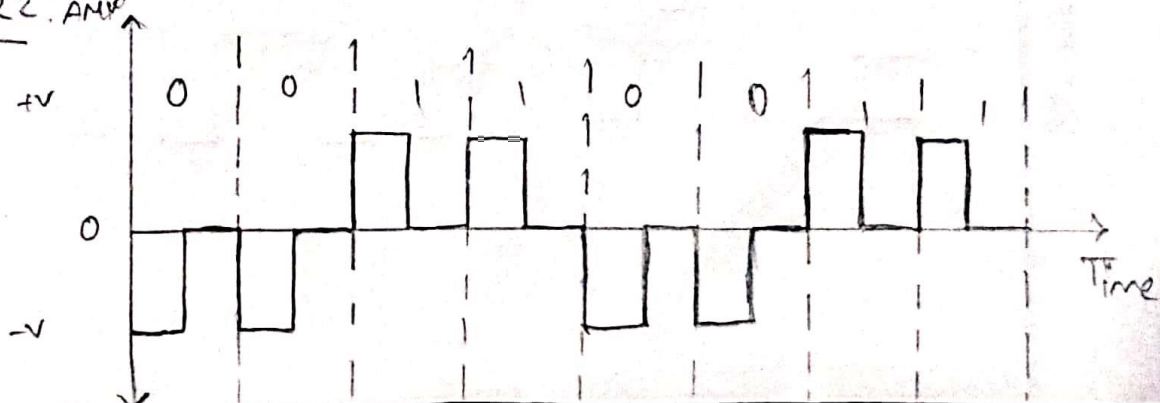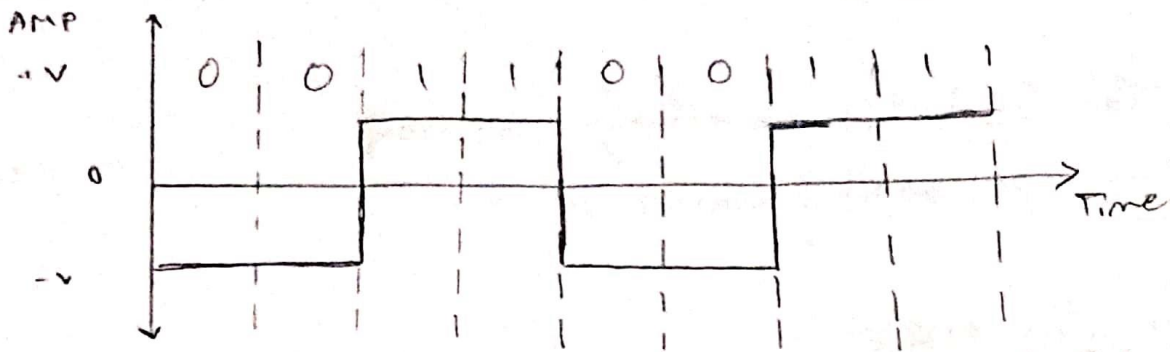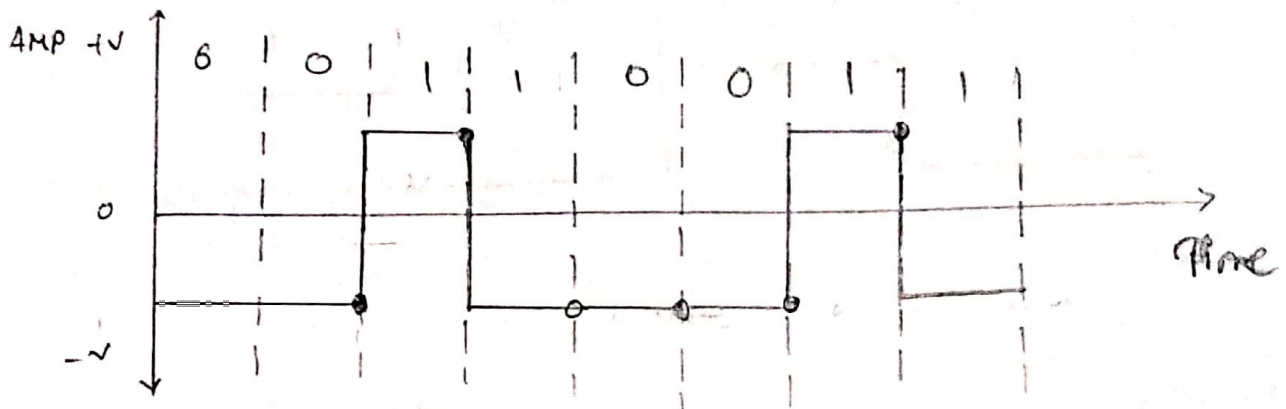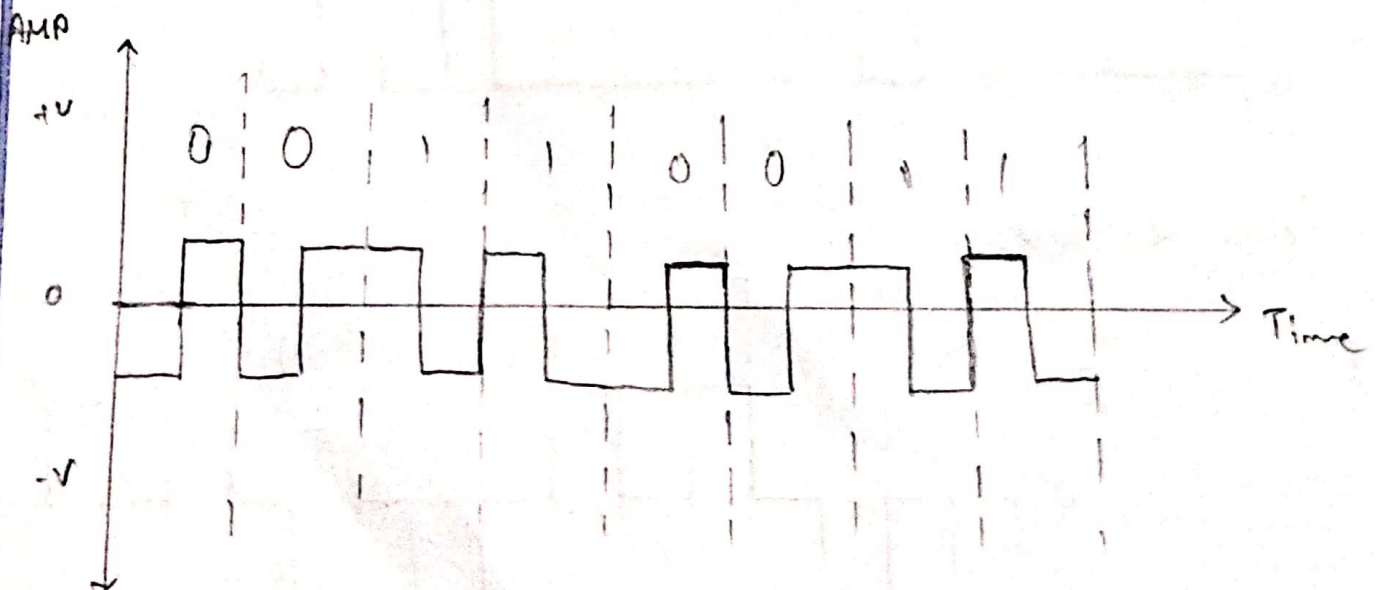
○ No inversion: Next bit is 0   ● Inversion: Next bit is 1

III) Bipolar Manchester: 0 is low to high ; 1 is high to low
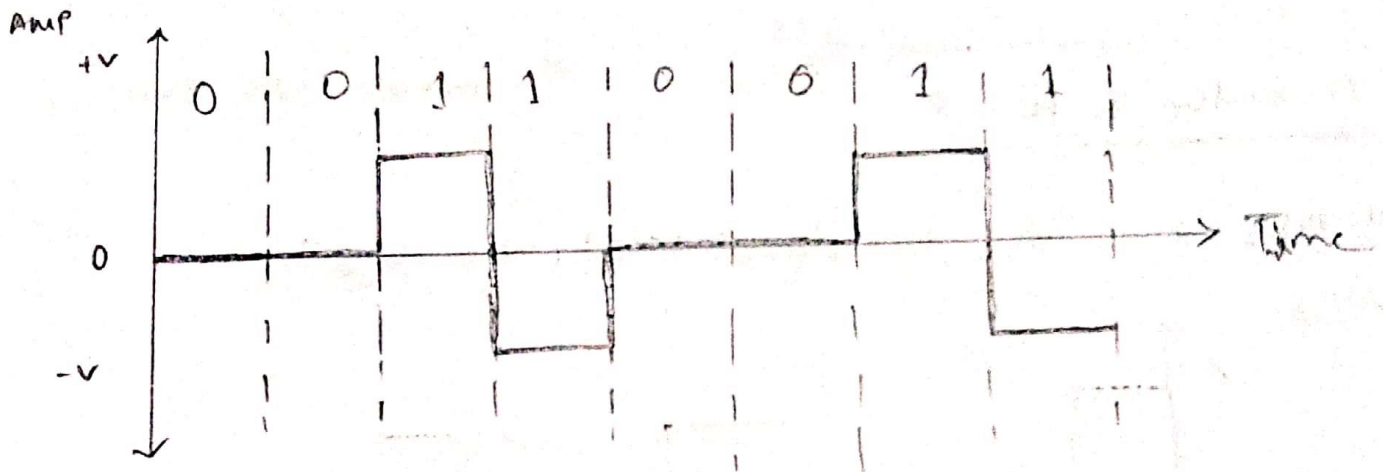
AMP

+V

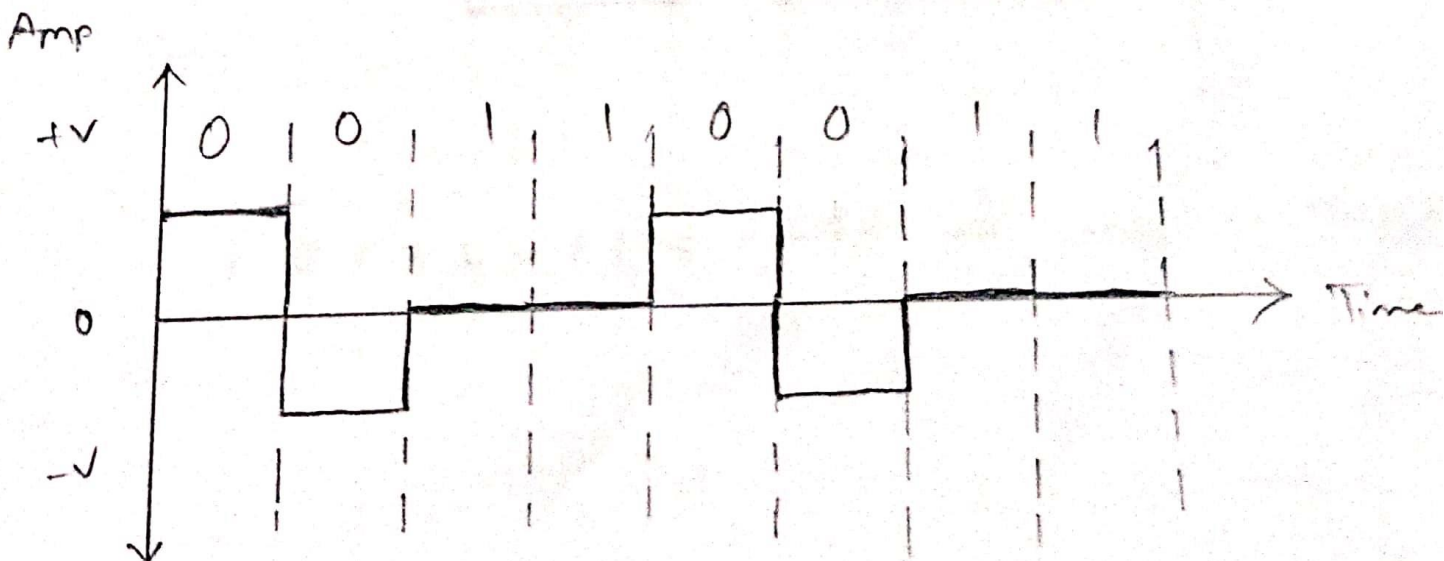0   0   1   1   0   0   1   1

0

→ Time

-V

Differential Manchester:

AMP

+V | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |

0 ──────────────────────────────────────→ Time

−V
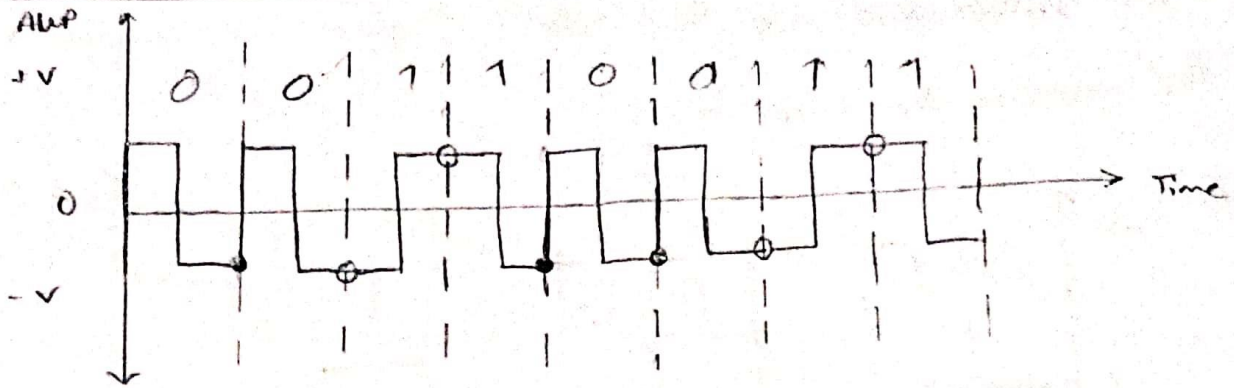
○ No inversion : Next bit 1   ● Inversion : Next bit 0

iv) Bipolar AMI:

AMP

+V | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |

0 ──────────────────────────────────────→ Time

−V

Bipolar Pseudoternary:

Amp

+V | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |

0 ──────────────────────────────────────→ Time

−V

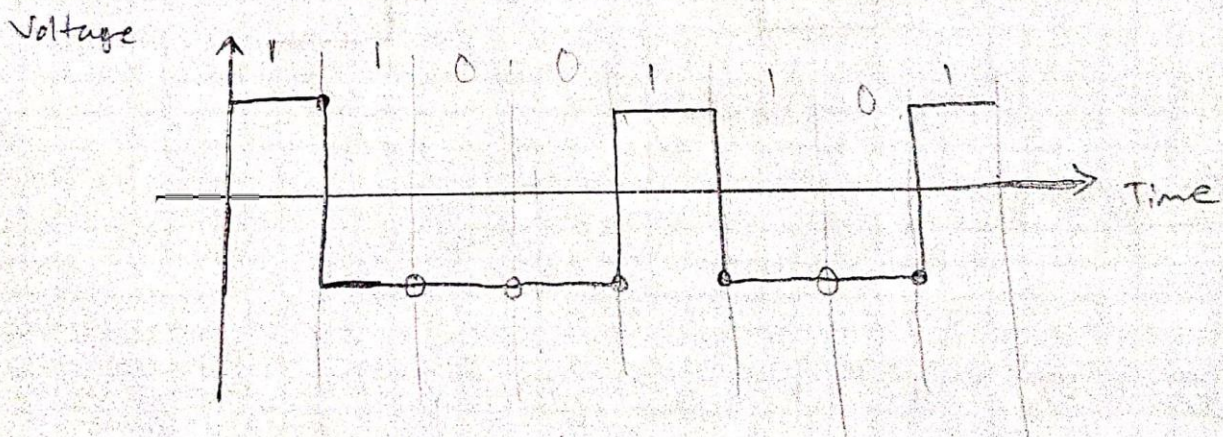<u>Multiline Transmission (MLT-3):</u>

v) last voltage level was 0

last nonzero level is positive
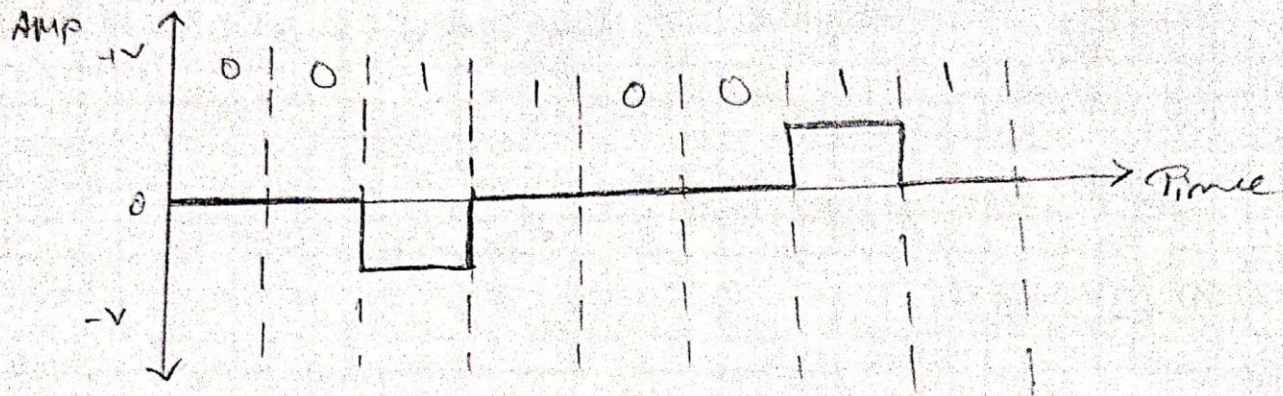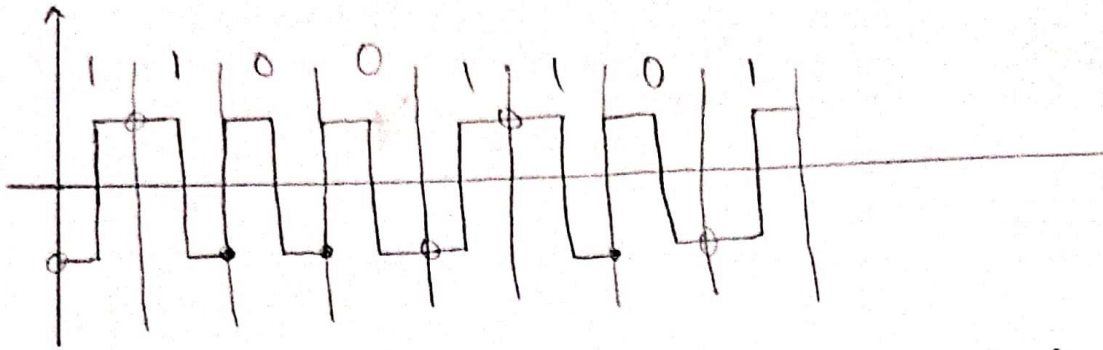

Ans to the Q. NO – 2

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1) NRZ-I   the last signal level was negative.

Computed data stream for NRZ-I = 1 1 0 0 1 1 0 1

11) Differential Machester!   the last signal level was negative

O No inversion : Next bit 1   • Inversion! Next bit 0

Computed data stream for Diff. Menchester is = 11 00 11 01