Digital Communication (ETEC - 303)
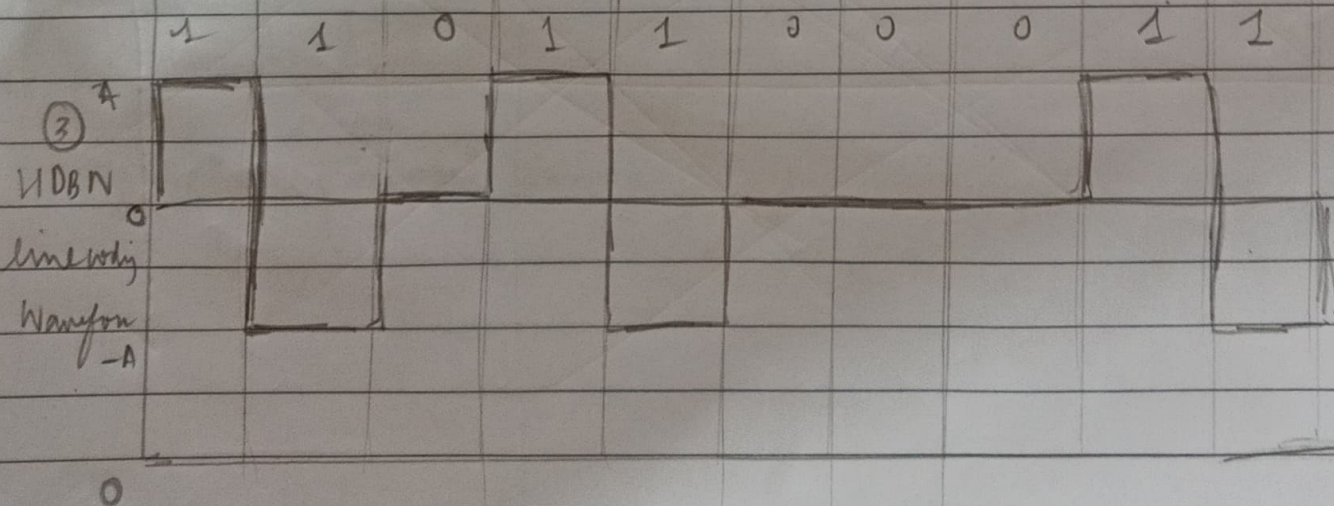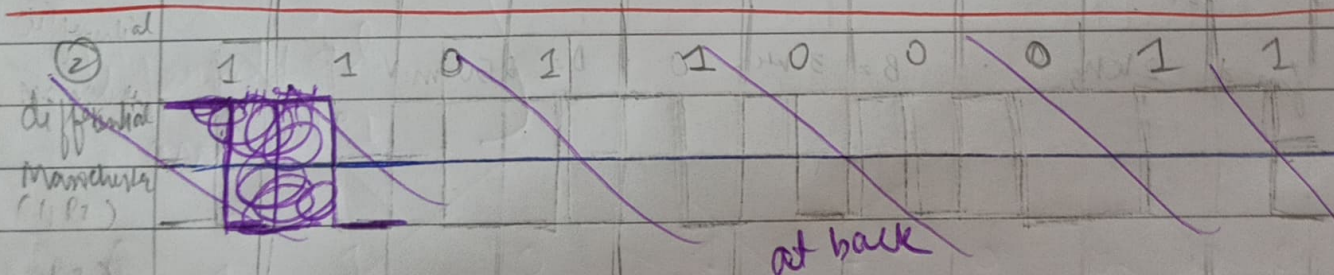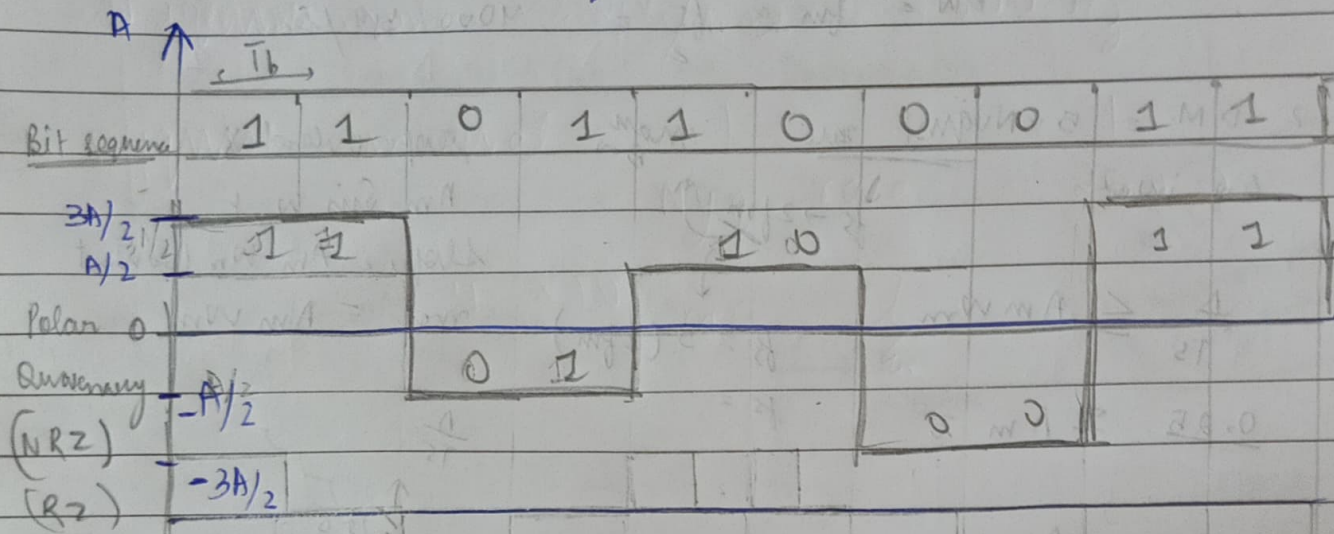
TEST - 1

Ans 1.

Binary data   1 1 0 1 1 0 0 0 1 1

→ Polar Quatenary →
$00 \rightarrow -3A/2$ $10 \rightarrow A/2$
$01 \rightarrow -A/2$ $11 \rightarrow 3A/2$

→ Differential Manchester $0 \rightarrow \lceil$ $1 \leftarrow \rceil$ Invertu

→ HDBN line code waveform

Bit sequence	1	1	0	1	1	0	0	0	1	1

Polar Quatenary (NRZ) (RZ)

Waveform levels: $3A/2$, $A/2$, 0, $-A/2$, $-3A/2$

②	1	1	0	1	1	0	0	0	1	1

differential Manchester (RZ)

at back

	1	1	0	1	1	0	0	0	1	1

③ HDBN line voltg Waveform

A , 0 , -A

Ans 2.

~~proposed~~ Manchester , Bipolar , ②Polar Quatenary

<u>DISADVANTAGES</u>

Bipolar
→ No clock signal is present for use.
→ long string of binary data with continuous 1's and 0's cause loss of synchronization

MANCHESTER
→ The fact that a manchester encoded signal required that more bits be transmitted then ture is the original signal.

POLAR QUATENARY
→ Greater complexity than polar NRZ-LO alu Polar NRZ-I
→ Required thrice as much ~~bpo~~ bandwidth than polar NRZ-L · or polar NRZ-I

Bipolar < Polar Quatenary < Manchester

[order of line coding techniques
  as per increasing bandwidth]

Ans 3.

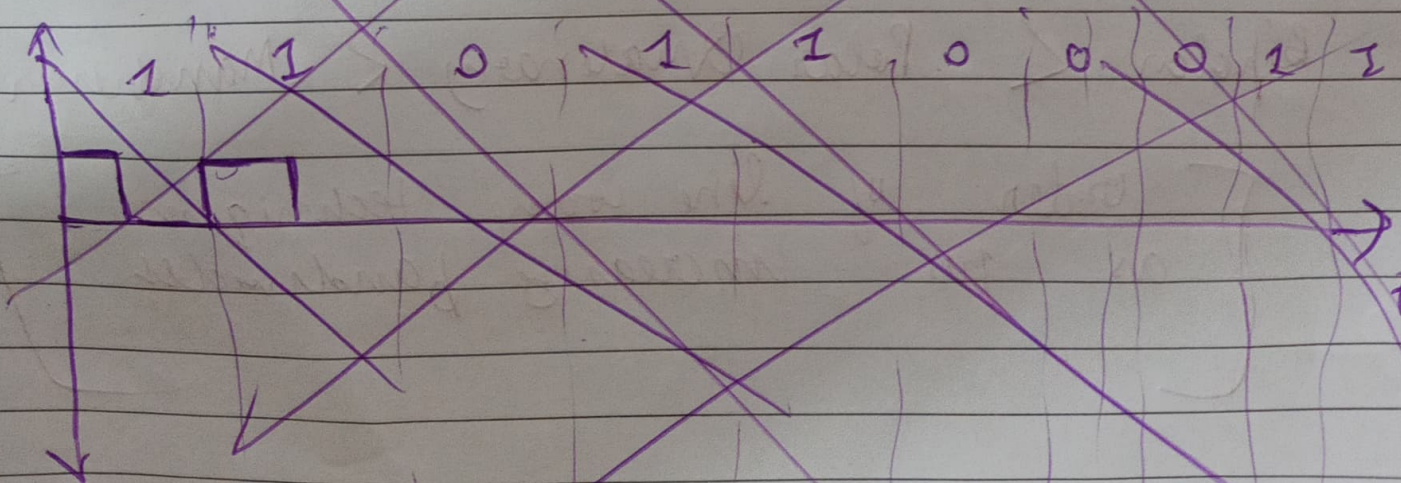$$g(t) = 1000 \sin(2500\pi t)$$

$$W = 2500\pi \quad rad/sec$$

$$\therefore f = \frac{W}{2\pi} = 1250 \, Hz$$

Nyquist rate $= 2 \times f_{max} = 2500 \, Hz$

Nyquist interval $= \dfrac{1}{Nyq. \, rate} = \dfrac{1}{2500}$

$$= 4 \times 10^{-4} \, ms$$
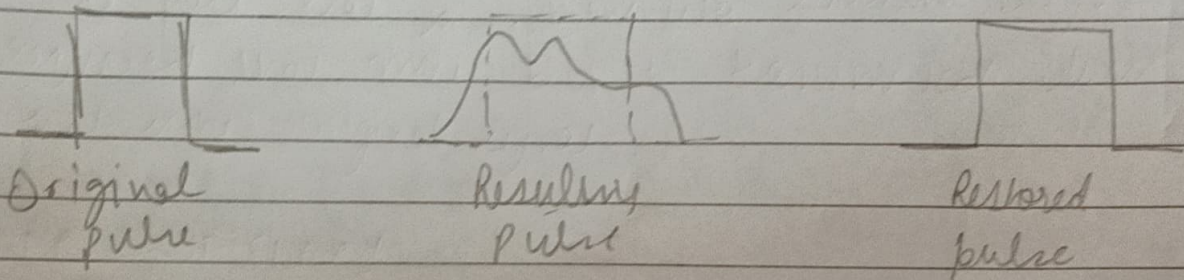
Ans 4.

differential
manchester

1   1   0   1   1   0   0   0   1   1

Ans 4. REGENERATIVE REPEATER

for any communication system to be reliable it should transmit and receive signal effectively, without any loss.

A PCM wave after transmitting through a channel gets distorted due to noise introduced by the channel.

Original   Resulting   Restored
pulse   pulse   pulse

for better reproduction of signal circuit is called as regenerative repeater and is employed in path before receiver.
This helps in restoring the signal from losses occured
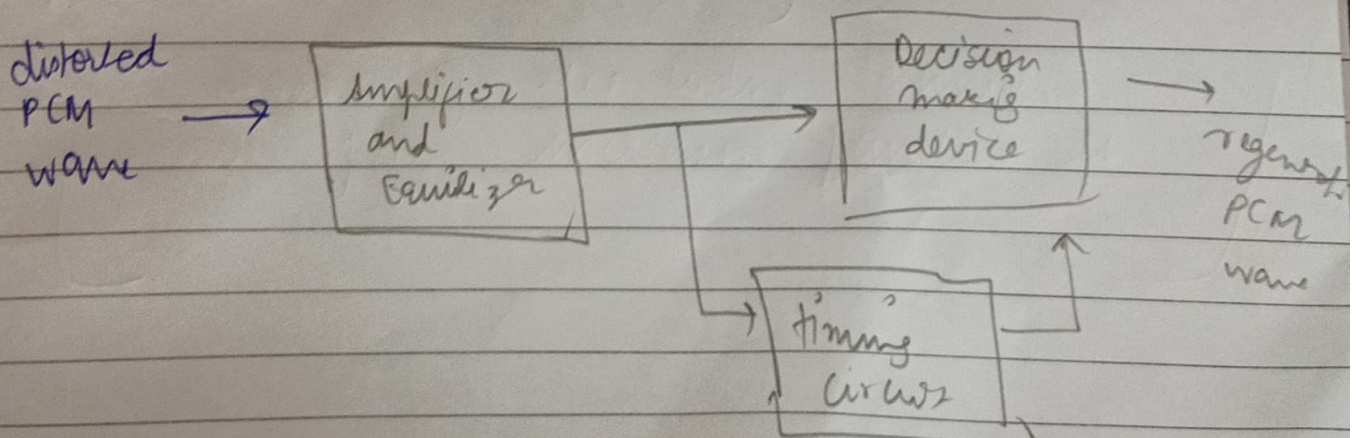
Ans 6. $g(t) = 10 \sin (200 \pi t)$

a) $(SNR) \, dB = 6.02 \, m + 1.76$

   $m = 5 \, bits$ quantization
   $m = 10$

$(SNR) \, dB = 6.02 \times 10 + 1.76$
        $= 60.2 + 1.76$
        $= 61.96 \, dB$

b) $SNR = (1.8 + 6n) \times B$

   $40 = 1.8 + 6n$

   $40 - 1.8 = 6n$

   $6n = 38.2$

   $n = \dfrac{38.2}{6} = 6.366$

   $n \approx 6$

Ans 1.

diffrential
manchester

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