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Course :- Computer Communication Network
Module :- 06
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Final Term Assignment
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QNO1,
a)- Given data:-
Data rate = 100 kbps

a)- Frequency = 0 KHZ ⇒ p = 1.
for NRZ-I when f/N = 0.
So the power is taken as 1.

P = Frequency ÷ Data Rate

b)- Frequency = 50 KHZ
= 50 ÷ 100 = 0.5×10^{-3}

Now:-
c)- Frequency = 100 KHZ
= 100 ÷ 100 = 1.

QNO1,
2)- Nyquist sampling rate = $2 \times f_{max}$
So:-
a)- In low pass filter
$B = f_{max}$ = 200 KHz.
So:-
Nyquist sampling rate
= 2 x 200 KHz
= 400,000 samples/sec.

b)- $f_{max} = 200 + 100 = 300\,KHz$

So:-

Nyquist sampling rate

$= 2 \times 300\,KHz$

$= 600,000$ samples/sec.

QNO1, 3(a)-

$B = f_{max} = 200 \times 10^3\,Hz$

$L = 1024$

$\therefore n_b = \log_2 1024$

$= \log_2 2^{10}$

$= 10.$

a)- Bit rate $= f_s \times n_b$

$= 2 \times 200 \times 10^3 \times 10.$

$= (4\,Mbps)$

b)-

$= 6.02 \times n_b + 1.76\,dB$

$= 6.02 \times 10 + 1.76\,dB$

$= (61.96\,dB)\star$

c)-

The value of $n_b = 10.$

$B_{PCM} = n_b \times B_{analog} = 10 \times 200\,KHz$

$= (2MHz)\star$

Q1:-

4)-

$B = 200 \times 10^3\,Hz$

$L = 4$

$N_{max} = ?$

So:-

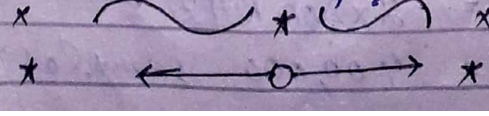
$N_{max} = 2 \times B \times \log_2 L$

$= 2 \times 200 \times 10^3 \times \log_2 4$

$= 2 \times 200 \times 10^3 \times \log_2 2^2$

$= 400 \times 10^3 \times \log_2 2^2$

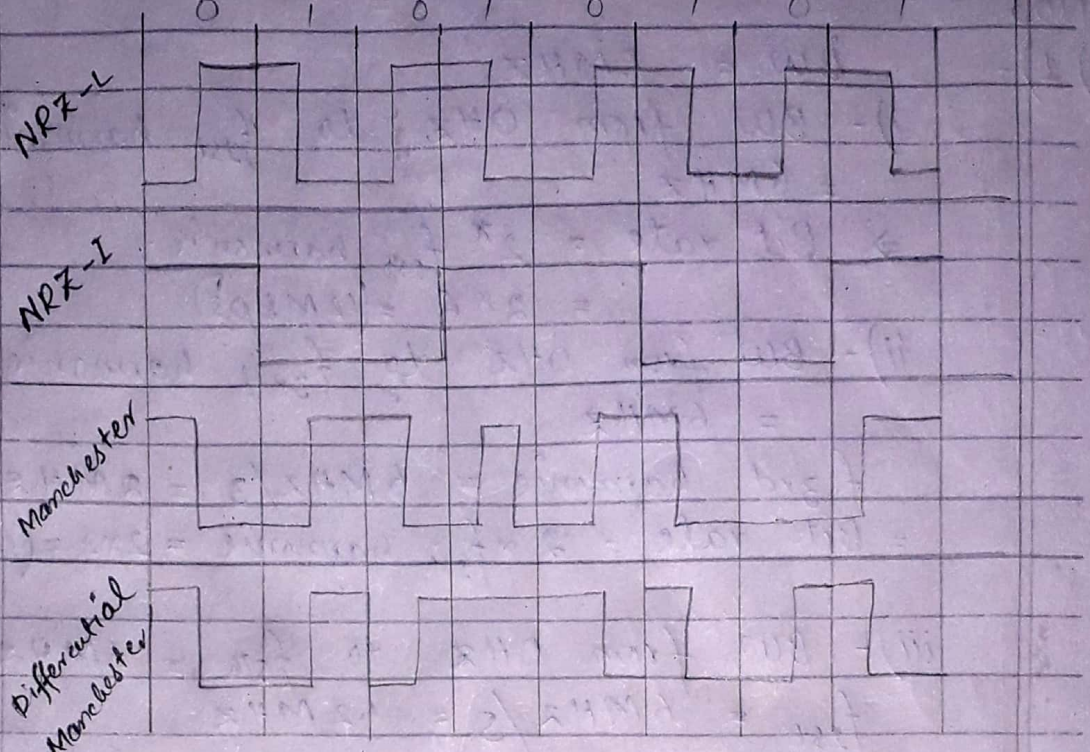
$(N_{max} = 800,000\,bps)\star.$



(01010101)

Q2:-

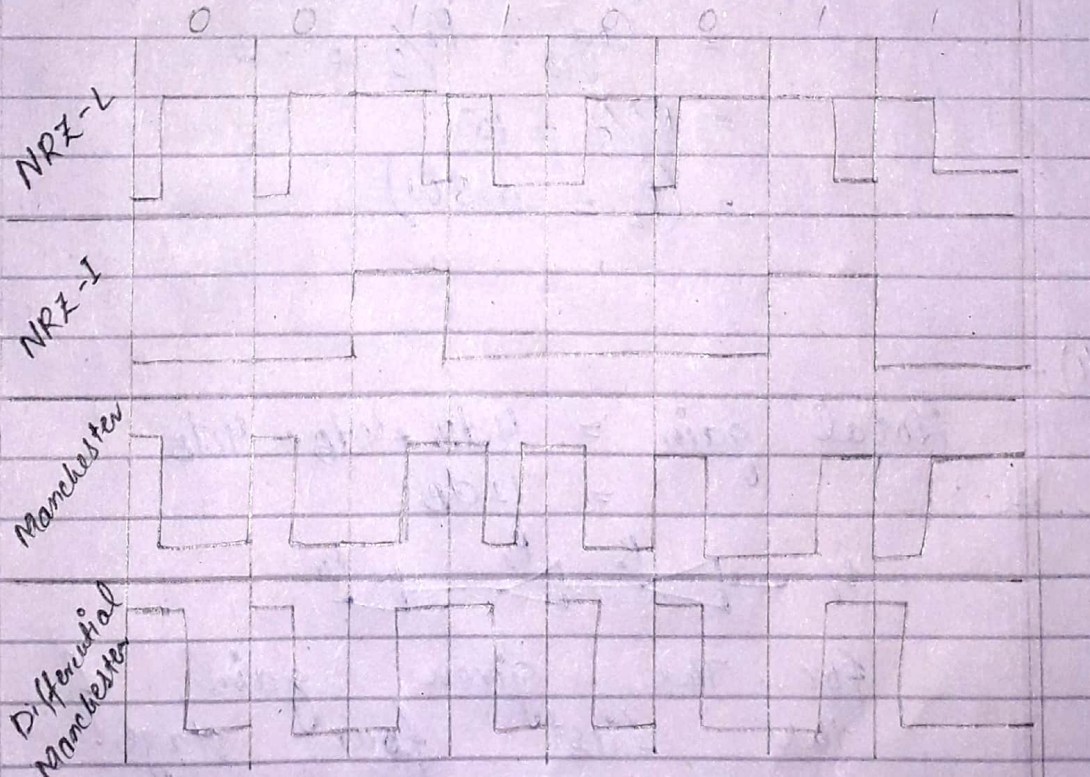
a)-

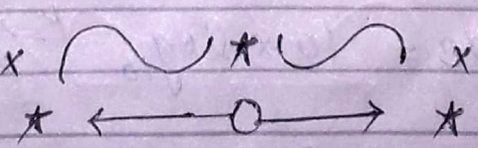


Q2:-

b)-

b)- 00110011.





QNo3

a) 1)- BW = 6MHz

i)- BW from 0Hz to f_{1st} harmonic
= 6MHz
⇒ Bit rate = $2^* f_{1st}$ harmonic
= 2 × 6 = (12Mbps)

ii)- BW from 0Hz to f_{3rd} harmonic
= 6MHz
f_{3rd} harmonic = 6MHz/3 = 2MHz
= Bit rate = 2 × f_{1st} harmonic = 2×2 = (4Mb/s)

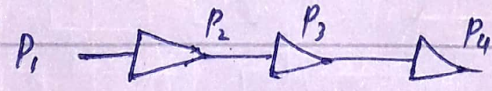
iii)- BW from 0Hz to f_{5th} = 6MHz
f_{1st} = 6MHz/5 = 1.2MHz
Bit rate = $2^* f_{1st}$ = 2×1.2 = (2.4Mbps)

a)(3)-

$$dB = 10\log_{10} P_2/P_1 = -10 = 10\log_{10} P_2/5$$
$$= \log_{10} = P_2/5 = -1$$
$$= P^2/5 = 10^{-1}$$
$$= (P_2 = 0.5W)$$

a)(4)-

Total gain = 4dB + 4dB + 4dB
= 12dB



for the given gain of the first four stage!

$$4dB = 10 \times \log_{10} P_2/P_1$$

P.T.O
→

$P_2/P_1 \ (10\,(4/10)) = 2.512$

power gain for 3-stages.

$= 2.512 \times 2.512 \times 2.512$

$= (15.851)$.

Now:-

a)(5)- Given band width 500 bps.

Frame = 100,000 bit

$= \frac{100{,}000}{5000 \text{ bps}} = (20 \text{sec})$.

a) 6)- The distance is 93,000,000 miles from earth.

Q3:-

b)-

Pulse rate $= 1/2\times10^{-3} = 500$ pulse/s

Bit rate = pulse rate $\times \log_2 L$

$L = 8$

So:-

{ Bit rate $= 500 \times \log_2(8)$ }.

$= 500 \times 3$

(" $= 1500$ bps) Ans: