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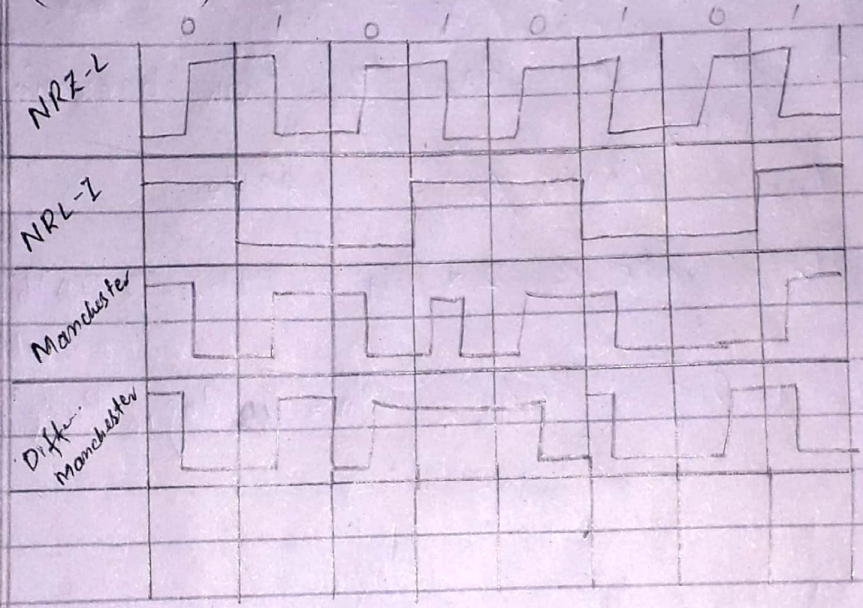
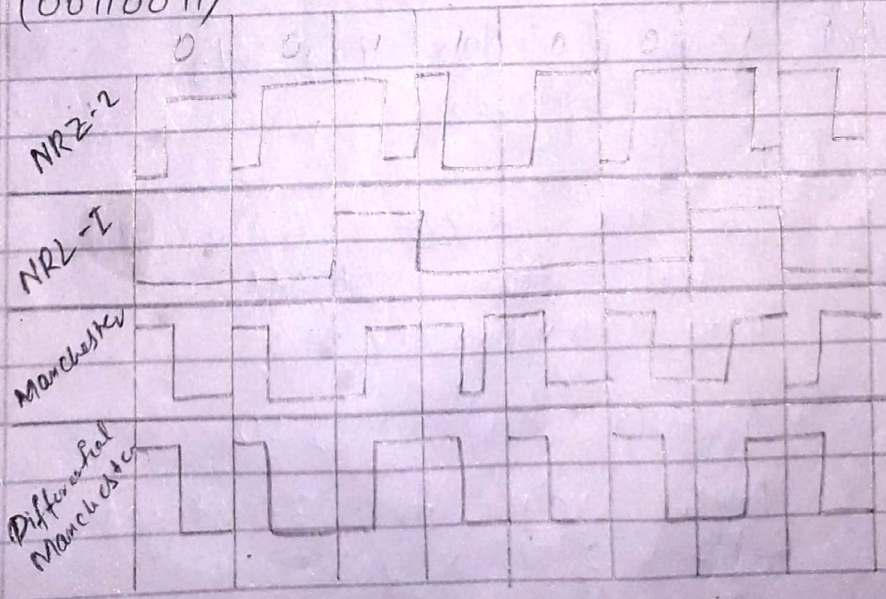
Assignment :- CCN (Final Spring 2020)
Module :- 06
~~Cont.~~
Date :- 22-06-2020.

Q2:-
a)- (10101010).



Q2:-
b)- (00110011)



QNo3

a) 1) BW = 6MHz

i) - BW from 0Hz to f_{1st} harmonic
= 6MHz

⇒ Bit rate = 2 x f_{1st} harmonic
= 2 x 6 = 12Mbps

ii) - BW from 0Hz to f_{3rd} harmonic
= 6MHz

f_{3rd} harmonic = 6MHz/3 = 2MHz

Bit rate = 2 x f_{1st} = 2x2 = 4Mbps

iii) - BW from 0Hz to f_{5th} harmonic
= 6MHz

f_{1st} = 6MHz/5 = 1.2MHz.

Bit rate = 2 x f_{1st} = 2x1.2 = 2.4Mb/s

a) 3) -

$$dB = 10 \log_{10} P_2/P_1 = -10 = 10 \log_{10} P_2/5$$

$$= \log_{10} = P_2/5 = -1$$

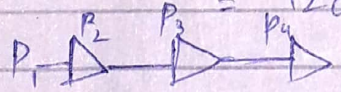
$$= P_2/5 = 10^{-1}$$

$$= (P_2 = 0.5\ W)$$

a(4) -

Total gain = 4dB + 4dB + 4dB.

= 12dB



for the given gain of the first four stages.

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

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

Power gain for 3-stages

= 2.512 x 2.512 x 2.512

= (15.851)

a)5)- Given band width = 500 bps.
Frame = 100,000 bit

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

Q(6)-

93,000,000 miles from earth.

Q3:-

b)- Pulse rate = $\frac{1}{2 \times 10^{-3}} = 500$ pulse/s

Bit rate = pulse rate x $\log_2 L$

$\therefore L = 8$

So,

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

$= 500 \times 3 = (1500 \text{ bps})$

Q1:-

a) Data rate = 100 kbps.

a)- frequency = 0 KHz $\Rightarrow P = 1$.

for NRZ-I when $f/N = 0$

power is taken as 1.

P = frequency ÷ Data rate.

b)- Frequency = 50 KHz

$= 50 \div 100 = 0.5 \times 10^{-3}$

Now

c)- Frequency = 100 KHz

$= 100 \div 100 = 1$.

Q1:-

2) Nyquist sampling rate - $2 \times f_{max}$

So:-

a)- In low pass filter

$B = f_{max} = 200$ KHz

So:-

N. Sampling rate
= 2 x 200 KHz
= 400,000 samples/sec.

b)- fmax = 200 + 100 = 300 KHz
Nyquist. S. rate = 2 x 300 KHz
= 600,000 samples/sec

Q1:-
3(a). B = fmax = 200 x 10^3 Hz
L = 1024

$n_b = \log_2 1024$
$= \log_2 2^{10}$
$= 10$

a) - Bit rate = fs x n_b.
= 2 x 200 x 10^3 x 10 = (4Mbps)

b)- 6.02 x n_b + 1.76 dB.
= 6.02 x 10 + 1.76 dB
= (61.96 dB)

c)- The value of n_b = 10
BPCM = n_b x Banalog = 10 x 200 KHz
= 2MHz

Q1:-
4)- B = 200 x 10^3 Hz
L = 4.
Nmax = ?

So:-
Nmax = 2 x B x $\log_2 L$.
= 2 x 200 x 10^3 x $\log_2 4$.
= 400 x 10^3 x $\log_2 2^2$.

(Nmax = 800,000 bps). Ans

The End