Anees Sher **Id#11743**

Computer Communication Network

Final paper

11743 Anees Sher

(1)

Q1 (a) An NRZ-I signals has a data..... 1KHz & 100KHz. 1/3

(a) $f/N = 0/100 = 0$ **P = 1.0**

(b) $f/N = 100/100 = 1$ **P = 0.0** 3

(c) $f/N = 50/100 = 1/2$ **P = 0.5**

(2) What is the Nyquist Sampling..... signals?

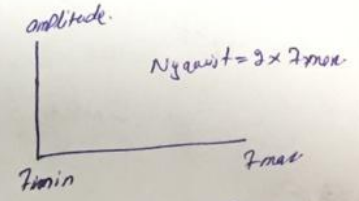
a) A Low Pass signals.

b) A band Pass signals.

(a) Low Pass signals = 200KHz.

= 200×10^3 Hz.

= 200,000 Hz.



In low Pass signals, the minimum frequency $f_{min} = 0$.

The Nyquist rate = $2 \times f_{max}$

= 2×200000 = 400000 samples/s.

(b) 200 KHz if the Lowest frequency is 100 KHz?

$f_{max} = 100 - 200 = 300$ KHz

$f_s = 2 \times 300000$

= 600,000 sample/s

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(3) we have sampled..... level of quantization (2)

a) Calculate the bit rate of the signals.
b) Calculate the SNRdB for this signals.
c) Calculate the PCM bandwidth of this signals.

a) $f_s \times n_b$.

$n_b = \log_2 L \rightarrow$ level

$n_b = \log_2 1024 = 1024 = 10 bits$

$f_s = 2 \times 200KHz = 400KHz$

Bit rate $= f_s \times n_b = 400\ KHz \times 10\ bits = 4mbps$.

b) The value of $n_b = 10$

$SNRdB = 6.02 \times n_b + 1.76 = 61.96 SNRdB$.

c) $BPCM = n_b \times B_{pcm} \log = 10 \times 200\ KHz = 2MHz$

(4) What is the maximum..... digital signals:

Here, bandwidth $= 200KHz = 200000\ Hz$

The maximum date rate can be calculated as.

$N_{max} = 2 \times B \times n_b = 2 \times 200000 \times \log_2 4 = 8 \times 10^8 bps$

$= 800\ KBPS$

P.T.O.

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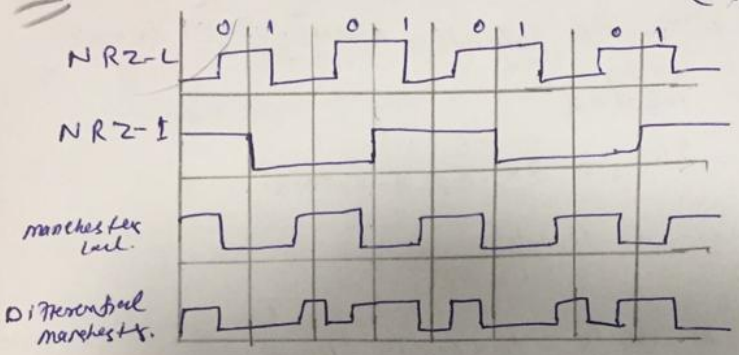
Q2 Draw the graph NRZ-L ..... following data stream. (3)

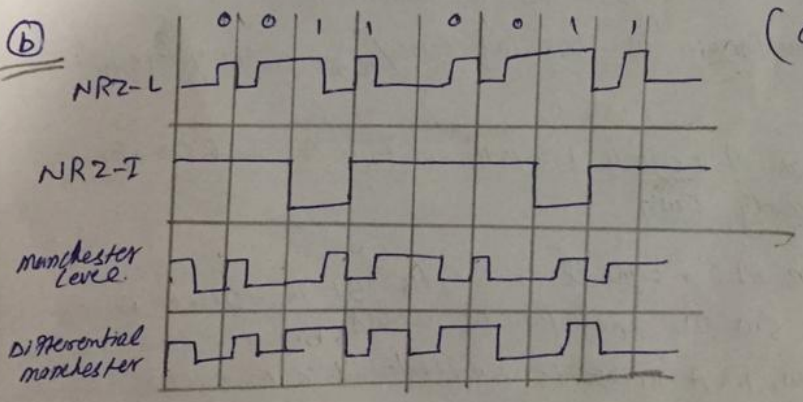
a) 01010101

b) 00110011

~~0 0 1 0~~ (0,0,1,0,1,0,1)



(b) (00110011)



Q3(a)

① A TV channel has a bandwidth of 6 MHz ..... & five harmonic?

Ans Bw = 6 MHz

① Bw from 0 Hz to 7 1st harmonic = 6 MHz; Bit rate = $2 \times 7 = 2 \times 6 = 12$ mbps.

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Ancestor 11743. (4)

(2) Bw from 0 Hz to 3rd harmonic = 6 MHz; 7 3rd. harmonic
3×7 -. 2 MHz Bit rate = 2×7 = 2×2 = 4 mbps.

(3) Bw from 0 Hz to 7 5th harmonic = 6 MHz; 7 1st harmonic
= 6MHz / 5 = 1.2MHz.
Bit rate = 2×7 = 2×1.2 = 2.4 Mbps.

A signals travels..... in decibels?

(2)
Attenuation of a signals = 10×10× log I/P / O/P.
Power at Point A is the input Powers.
Powers at Point B is the outPowers.
Attenuation in dB = 10× log (100/90) = 0.457575dB.

(3) The attenuation of a signals is -10dB. what is the final signals Power if it was originally 5w?

Ans The attenuation of a signals is -10dB. If the signals Powers was originally 5w The final Power would be a 50w b. 05w c. 2w d = 10w, 7. A seciver is operated at a temperature of 300K. The transistor used in the receiver has a average output resistance of 1/k9Ω. K = 1.38 × 10-255; The noise Powers for receivers with a bandwidth of 200KHz. is a. 0.8287 w.b 8.4 w.c 8.28n w. 1.98u w8. At a certain Point in communication system. The signals Powers is 20mw & The noise Powers is 10.11w. The data we Can Compute The SNR(dB) to be a. 3dB, b 33dB.
33dB - 3bB = 0.3dB //

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(4) A signals has passed through three..... How much is the signals amplified? (5)

Ans An amplifier is used to improve the power of a signals moving from one point to another. Net the signals is passed through three amplifiers, therefore the signals power is improved 3 times & each time the attenuation is 4db. Therefore the total gain achived on the signals is $3 \times 4 = 12dB$.

(5) If the bandwidth of channel 5KbPs..... out of device?

Sol:- Bandwidth 5000bPs, frame 100,000 bit.

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

(6) The light of the sun..... the earth?

Ans The sun varies about 93 million miles. distance from the sun to earth.

(b) A signal has eight data level..... rate & bit rate?

Sol:- Pulse rate $= \frac{1}{2 \times 10^{-3}} = 500$ Pulse/sec.

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

$L = 8$

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