Printed Pages: 4 **NEC-702(A)**

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 2295034 **Roll No.** | | | | | | | | | |

B.TECH

Regular Theory Examination (Odd Sem - VII),2016-17

ANALOG & DIGITAL COMM.

Time : 3 Hours ***Max. Marks : 100***

SECTION - A

1. Attempt all 10 parts from the following :(10×2=20)

(a) Draw the Basic block diagram of analog communication system.

(b) Determine the pulse transmission rate in terms of transmission bandwidth B_T *and the roll off factor r.* Assume a scheme using *Nyquits* First Criteria?

(c) Which passband modulation can't be detected using non coherent technique? What is the reason for this?

(d) Define Modulation and explain the need of Modulation?

(e) What is the purpose of multiplexing?

(f) Explain the difference between TDM & FDM.

(g) Giving the drawbacks of DSB-SC, explain the need of SSB-SC.

(h) What is Kraft Inequality?

(i) What is frequency deviation and explain the carson's rule.

(j) An analog signal is bandlimited to 4 KHz. It is sampled at the Nyquist rate and the samples are quantized into 4 levels. The quantization levels are independent messages having probability P1=P2 =1/8 and P3=P4 =3/8. Find the information rate of the source.

SECTION - B

2. Attempt any 5 parts from the following 8 parts : (5×10=50)

a) Explain Multiplexing concept and then explain T-1 carrier multiplexing scheme. Draw the TDM hierarchy and write down the bit rate at each multiplexing stage.

b) Consider 8 alphabet source with probability of occurrence as follows :

Symbol (xi)	A	B	C	D	E	F	G	H
Probability [p(xi)]	.30	.20	.15	.12	.10	.07	.04	.02

According to Shannon - Fano techniques, generate the binary codes.

c) Differentiate between TRF receiver and Super heterodyne receiver. What are the functions of receiver?

d) Draw and explain Envelope Detector circuit for demodulation of AM signal along with the appropriate Time Constant range.

e) i) A 400W carrier is amplitude modulated to a depth of 100%. Calculate the total power in case of AM and DSB-SC technique. How much power saving is achieved for DSBSC. If depth of modulation is changed to 75% then how much power is required for transmitting DSBSC wave.

ii) A SSB transmitter radiated 0.5KW when the modulation percentage is 60%. How much of carrier power is required if we want to transmit the same message by an AM transmitter.

f) Explain the working of Quadrature Phase Shift Keying with transmitter and receiver. Draw the constellation diagram and phase diagram. Drive the Probability of error for the same.

g) i) Draw and explain the block diagram of transmitter and receiver of DPCM.

ii) Consider a sinusoidal signal $m(t) = A\cos\omega mt$ applied to a delta modulator with step size Δ. Explain the condition when delta modulator avoids slope overload distortion.

h) Determine the Huffman code for the following message with their probabilities given :

x	x1	x2	x3	x4	x5	x6	x7
P	0.05	0.15	0.2	0.05	0.15	0.3	0.1

Also calculate the entropy, redundancy and efficiency of the codes generated.

SECTION - C

Note : Attempt any 2 parts from the following 3 parts : (2×15=30)

3. i) Using block diagram, explain generation and detection of DPSK system for data d(t) = 0 1 1 0 1 and also draw the waveform.

ii) Explain bit interleaving.

4. i) With the help of block diagram explain the working of Delta modulation How Adaptive Delta modulator improves the performance of Delta modulator?

ii) Explain different type of internal and external noises.

5. i) Explain the generation and detection of FSK.

ii) Give the comparison details of ASK, FSK and PSK.