(3 Hours)

[Total Marks: 80]

Note: Question No 1 is compulsory.

Attempt any **three** questions out of remaining.

Assume suitable data if required.

Q1)   a) Differentiate between high level and low level modulation.   (20)

b) Draw PCM transmitter and receiver.

c) Explain Quantization process.

d) Explain power line carrier communication.

Q2)   a) Draw and explain BPSK system.   (10)

b) An AM carrier is   modulated with an audio signal given by

$$m(t) = 0.2\sin(w_1(t) + 0.5\cos w_2 t)$$ Where f1=500Hz & f_2=1000Hz .The peak amplitude of the carrier signal A_c =10 volt and carrier frequency F_c=50 Khz. Assume 50Ω load . a) Evaluate & sketch the spectrum of AM wave b) Calculate modulation index c) Find average power of the AM wave d) Find the power carried by the side bands.

Q3)   a) Compute the Huffman code for this source moving the combined symbols high as possible and   compute Efficiency η   (10)

Symbol	s_0	S_1	S_2	S_3	S_4	S_5	S_6
probability	0.25	0.25	0.125	0.125	0.125	0.0625	0.0625

b) Explain Delta modulation   (10)

Q4)   a) Explain any two methods of suppression of sidebands in AM .   (10)

b) Explain the function of Foster Seely discriminator with the help of neat circuit & phasor diagram.   (10)

Q5)   (a) Define   a) Entropy information rate b) Channel Capacity c) Sampling theorem   (10)

(b) Explain super heterodyne receiver with neat diagram   (10)

Q6)   a) The generator polynomial of a (7,4) cyclic code is $x^3 + X + 1$.Implement the Encoder.

Using Encoder determine the codeword for D= 0011   (10)

b) Explain regarding DPSK (i) Transmission (ii) Reception (iii) Waveform for data bit Sequence b(t)=1011001   (10)

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