

(3)

(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
 $m(t) = 0.2\sin(\omega_1 t) + 0.5\cos(\omega_2 t)$ Where $f_1 = 500\text{Hz}$ & $f_2 = 1000\text{Hz}$. 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)