L SE CMPN Sem - IV CBSD

A & D C

17 | 122 : 2hd half.11-AM(f)

Con. 6643-11. **MP-4327**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. 1 is **compulsory.**
(2) Attempt any **four** questions from the remaining **six** questions.
(3) Answer to questions should be **grouped** and written **together.**

1. (a) An AM signal appear across a 50 Ω load and has the following equation —
$V(t) = 10 (1 + \text{Sin } 2\pi \times 10 \times 10^3 t) \text{ Sin } 4\pi \times 10^6 t$
(i) Calculate the modulation index, side band frequencies, total power and band width. 6
(ii) Sketch the envelope of SSB signal in time domain. Also draw the spectrum of SSB signal. 4
(b) Draw the block diagram of Armstrong Frequency Modulation System and explain its working. 10

2. (a) What are the various pulse modulation techniques ? Give one method for the generation of PAM. 10
(b) Compare TDM with FDM. 5
(c) Explain TDM in detail. 5

3. (a) Draw neat block diagram of Delta modulator and explain its working. What are the drawbacks of delta modulator and how are they overcome by ADM. 10
(b) Draw a neat block diagram and waveforms for PCM transmitter and receiver and explain the working. 10

4. (a) Explain :— (i) Shanon Hartley Capacity theorem. 10
(ii) Intersymbol Interference and equalization.
(b) Explain Matched filter and optimum receiver. 10

5. (a) Explain the QAM Transmitter and Receiver. 10
(b) Explain the functioning of BPSK (Binary Phase Shift Keying) Transmitter and Receiver with the help of a neat diagram. 10

6. (a) The generator matrix of (6, 3) systematic block code is given by — 10

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$

(i) Find the Code Vectors
(ii) Find the Parity Check Matrix
(iii) Find the error syndrome.
(b) Write a short note on the following :—
(i) Viterbi Algorithm 5
(ii) Cyclic Code. 5

7. Write short notes on any **three** of the following :— **20**

(a) Line Codes
(b) Thermal Noise
(c) Eye Pattern
(d) Image frequency and its rejection
(e) Sampling theorem for lowpass band limited signal.