

Unit -1

- 1 a) Write formula of Fourier transform of a periodic function  $f(t)$ .
- b) What is Auto correlation?
- c) Draw a GATE function and find its Fourier transform,
- d) Find the Fourier transform of a periodic impulse function.

OR

Write all the properties of Fourier transform and explain time shifting property\*

Unit - II

2. a) Explain Baseband and carrier signals.
- b) Give a bandwidth comparison for different analog modulation systems.
- c) Explain the need of modulation.
- d) Explain synchronous detection technique. Also explain errors in synchronous detection.

OR

Compare AM and FM systems.

Unit - III

3. a) Differentiate TDM and FDM.

- b) Why PAM signal is not digital signal.
- c) Explain natural and flat top sampling.
- d) Draw block diagram of PCM system and explain its working.

OR

What is Delta modulation. What are the limitations of delta modulation and how can we overcome them.

Unit-IV

4. a) Write some digital modulation techniques. Why they
- b) What is probability of error.
- c) Explain MODEM,
- d) Explain Binary phase shift keying system with diagram. What is its bandwidth.

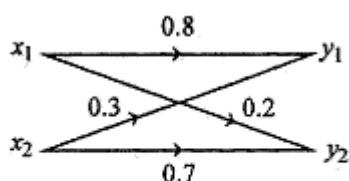
OR

Write a short note on QAM system.

Unit - V

5. a) Define Entropy with expression.
- b) What is channel capacity?
- c) Draw a model of a communication system and explain it\*
- d) Consider a source with seven possible symbols  $X_j = 1, 2, y, \dots, \infty$  and the corresponding probabilities  $P_1 = 0.33, P_2 = 0.33, P_3 = 0.16, P_4 = 0.07, P_5 = 0.04, P_6 = 0.02$  and  $P_7 = 0.01$ . Construct the Huffman code.

OR



Given  $P(x_1) = 0.6, P(x_2) = 0.4$

Find the mutual information and channel capacity