

QP Code : 31166

[3 Hrs]

Total Marks : 80

Instructions:

1. Question No: 1 is compulsory.
2. Answer any three from the remaining questions.

1

- a) State and prove any two properties of Fourier Transform.
- b) Write down the basic principle used in Super heterodyne receivers.
- c) If a FM wave is represented by equation $V = 12 \sin(6 \times 10^8 t + 5 \sin 12500 t)$
Calculate:

1. Carrier Frequency	2. Modulation index
3. Maximum deviation	4. Modulating frequency

d) Brief the properties of entropy

2

- a) Explain a method of generating a single side band signal using Balanced modulators. (10)
- b) Explain a method of generation of an Amplitude modulated signal and sketch the time domain waveform of message carrier and modulated signals. (10)

3

- a) (a) State Shannon's First Theorem. A discrete memory less source has five symbols X_1, X_2, X_3, X_4 and X_5 with probabilities $P(X_1) = 0.4, P(X_2) = 0.19, P(X_3) = 0.16, P(X_4) = 0.14, P(X_5) = 0.11$. Construct the Shannon - Fano code for this source. Calculate the average code word length and coding efficiency of the source. (10)
- b) Explain the generation of a Delta modulated signal. State the drawbacks of DM and suggest methods to overcome it. (10)

4

- a) Briefly discuss on various error control codes and explain in detail the convolution code with one example. (10)
- b) Draw the block diagram of a PCM communication system. Explain the function of each block with a neat sketch of input and output at each stage. (10)

5

- a) Explain generation and reception of BPSK system (10)
- b) With a neat block diagram, explain the operation of Armstrong Frequency modulation system. (10)

6

Write short notes:

- 1) Optical Fiber Communication
- 2) Pre-Emphasis and De-Emphasis.
- 3) Advantages of Digital Communication Systems