

Q. P. Code: 23923

[3 Hrs.]

Total Marks : 80

Instructions:

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

- 1 (5 x 4)
 - a) State and prove any two properties of Fourier Transform.
 - b) Write down the basic principle used in Super heterodyne receivers.
 - c) Explain the quantization process in PCM.
 - d) Brief the properties of entropy

- 2
 - a) Explain a method of generating a single side band signal using Balanced modulators. (10)
 - b) Draw the spectrum of AM wave, if the modulating signal is $m(t) = (\cos 2000 \pi t) + 0.5 (\cos 4000 \pi t)$. And the carrier is $c(t) = 1.5 (\cos 10000 \pi t)$. calculate total power, side band power and bandwidth. (10)
 $R = 50 \Omega$
 $S_0 = 0.4$
 $S_1 = 0.2$
 $S_2 = 0.2$
 $S_3 = 0.1$
 $S_4 = 0.1$
 ignore S5

- 3
 - a) Give the procedure for Shannon-Fano coding and use the procedure for obtaining the source code for the source symbols $S_0, S_1, S_2, S_3, S_4, S_5$ with their respective probabilities: 0.4, 0.2, 0.2, 0.1, 0.1. Also compute the code efficiency. (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 the working principle of an ASK modulator. (10)
 - b) With a neat block diagram, explain the operation of Armstrong Frequency modulation system. (10)

- 6
 - a) Write short notes: Any Two (20)
 - 1) Optical Fiber Communication
 - 2) Pre-Emphasis and De-Emphasis.
 - 3) Advantages of Digital Communication Systems
