Exam.Code:0932
Sub. Code: 33703

2015

B.E. (Electronics and Communication Engineering)

Eighth Semester

EC-809: Advanced Digital Communication

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: ***Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Section.***

x-x-x

1. Attempt the following:
   a) What is the need of lowpass equivalent of bandpass signals?
   b) What shortcomings are overcome in offset QPSK?
   c) What is matched filter receiver?
   d) What is non-linear distortion?
   e) How is the performance of OFDM systems degraded? (5x2)

SECTION-A

2. a) Differentiate between lowpass and band pass signals. How so you obtain the lowpass equivalent of bandpass signals?
   b) What are orthonormal functions? Explain the Gram-Schmidt procedure for obtaining a set of orthonormal functions. (2x5)

3. a) Obtain the PSK signal in terms of orthonormal basis functions and show its signal space diagrams for M=2,4,8
   b) What are CPFSK signals? How are they represented? (2x5)

4. a) Give the structure of a correlation receiver with N correlators and explain its working.
   b) Give the mathematical model of a channel with attenuation and additive noise. How do regenerative repeaters generate clean signals? (2x5)

SECTION – B

5. a) With the help of suitable waveforms, show the effect of channel distortion on signal input. What is the role of equalizer?
   b) How is the design of band-limited signals with controlled ISI carried out? Give the time-domain and frequency-domain characteristics of a duobinary signal. (2x5)

6. a) With the help of an example and using the trellis diagram, explain the Maximum-likelihood sequence data detection method for controlled ISI.
   b) Give the structure of a decision-feedback equalizer and explain how it can be used to reduce ISI. (2x5)

7. a) Give the model of a multi-channel digital communication system. What are the advantages of multi-channel modelling?
   b) What is an OFDM signal? Give the filter-bank implementation of an OFDM receiver. Illustrate the frequency-response characteristics of this implementation and give its advantages. (2x5)

x-x-x