Exam.Code:0932
Sub. Code: 33703

2055

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 Part.

x-x-x

1. i. What is the difference between baseband and bandpass signal representation? 10x1
   ii. Define Power Spectral Density (PSD).
   iii. What is the purpose of a matched filter in digital communication?
   iv. List two advantages of multicarrier modulation over single-carrier modulation.
   v. What does the Nyquist criterion aim to eliminate?
   vi. Differentiate between deterministic and random signals.
   vii. Name two memoryless modulation schemes.
   viii. What is the role of equalization in communication systems?
   ix. Explain the term orthogonality in the context of OFDM.
   x. What is ISI and why is it problematic?

PART A

2. (a) Explain the mathematical models used for different types of communication channels. 5,5
   (b) Explain the concept of signal space representation of waveforms with derivation.
3. (a) Discuss Quadrature Amplitude Modulation (QAM) with the help of signal constellation diagrams. 5,5
   (b) Discuss the partial response CPM with neat diagram.
4. (a) Explain the implementation of the correlation receiver and its role in AWGN channels. 5,5
   (b) A radio transmitter has a power output of PT=1W at a frequency of 1GHz. The transmitting and receiving antennas re parabolic dishes with diameter D=3m. The distance between transmitter and receiver antenna is 20Km. (i) Determine the antenna gains, (ii) Determine EIRP of the transmitter, (iii) Determine the signal power at the output of receiving antenna in decibels

PART B

5. (a) Derive and explain the Nyquist criterion for zero ISI. 5,5
   (b) Discuss the role of Decision Feedback Equalizer in ISI channels.
6. (a) Explain MLSE (Maximum Likelihood Sequence Estimation) for discrete time white noise filter model. 5,5
   (b) Give spectral characteristics of multicarrier signal and briefly explain Bit and power allocation in multicarrier modulation.
7. (a) Discuss Multichannel Digital Communication in AWGN Channels using binary signals. 5,5
   (b) Explain Orthogonal Frequency Division Multiplexing in detail with neat diagram.

x-x-x