Roll No ....

MEDC - 302(A)
M.E./M.Tech., III Semester
Examination, December 2014
Advanced Digital Communication (Elective-I)

Time : Three Hours

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Note: i) Attempt any five questions.
     ii) All questions carry equal marks.

1. a) What is MSK? Draw the signal space diagram and show the signal constellation of an MSK signal.
   b) What is OQPSK? What are its advantages and disadvantages? Compare it with MSK. Show representation of MSK as an OQPSK signal with a sinusoidal envelope.

2. a) Explain optimal detection and error probability for PAM signaling.
   b) A binary digital communication system transmits data over a wireline channel of length 1000 km repeaters are used every 10 km to offset the effect of channel attenuation. Determine the E_b/N_o that is required to achieve a probability of a bit error of 10^{-5} if
      i) Analog repeaters are employed and
      ii) Regenerative repeaters are employed.

3. a) Based on an ML criterion, determine a carrier phase estimation method for binary on-off keying modulation.
   b) Explain carrier recovery and symbol synchronization in signal demodulation.

4. a) Describe designing of the receiver in the presence of inter symbol interference and AWGN.
   b) Draw the structure of decision feedback equalizer and explain the operation.

5. a) Compare in detail linear equalization, decision feedback equalization, adaptive linear equalization and adaptive decision feedback equalizer.
   b) With the help of a neat block diagram explain the working of DS spread spectrum system.

6. a) Explain the principle of FHSS system explain
      i) How acquisition is accomplished
      ii) Tracking is performed in FHSS system.
   b) How PN sequences are generated? Ideally what are the characteristics required to be possessed by a PN sequence to be used in CDMA applications.

7. a) Derive the error rate performance of binary PSK when the signals are transmitted over a frequency nonselective, slowly fading channel.
   b) Explain diversity techniques for fading multi path channels.

8. Write short notes on any two of the following
      i)   Link budget analysis
      ii) Modulation codes for spectrum spacing
      iii) OFDM
      iv) Coded waveform for padding channels and their applications

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