# G 6139

## M.E. DEGREE EXAMINATION, MAY/JUNE 2007.

### First Semester

### Communication Systems

### CO 1602 — MODERN DIGITAL COMMUNICATION TECHNIQUES

(Common to ME-Digital Communication and Network Engineering,

ME-Computer and Communication and ME-Optical Communication)

(Regulation 2005)

Time : Three hours                                    Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   Define memoryless channel.

2.   How will you generate the convolutional codes?

3.   What are the general characteristics of a coherent receiver?

4.   What is a multi dimensional signal? Give an example.

5.   When a channel is called as Ricean channel?

6.   What are the causes for ISI?

7.   The bandwidth of the media is 4 KHz and the SNR is 3100. Find the channel capacity.

8.   What is a Golay Code?

9.   Define coding gain. How to increase it?

10.  Compare the Maximum likelihood and Viterbi algorithm methods for decoding.

PART B — (5 × 16 = 80 marks)

11. (a) (i) What is an M-ary Markov source? Explain. (6)

    (ii) Discuss in detail about continuous phase modulation. (10)

Or

    (b) Describe the scalar and vector communication over memoryless channel. (16)

12. (a) With a neat block diagram explain the function of DPSK and MPSK demodulators. (16)

Or

    (b) (i) Discuss the different type of IQ modulation. (10)

    (ii) Describe the function of M-FSK receiver. (6)

13. (a) (i) What is an eye pattern? How it is used to know the information about a channel. (6)

    (ii) Describe the different equalization techniques used for band limited channels. (10)

Or

    (b) Derive the decision rule for optimum demodulation of digital signal in the presence of ISI and AWGN. (16)

14. (a) (i) What is a matched filter? Explain the different properties of it. (10)

    (ii) Explain the concept of direct sequence spread spectrum. (6)

Or

    (b) With a suitable example explain the Hamming and cyclic codes. (16)

15. (a) With an example describe the following :

    (i) State diagram

    (ii) Tree diagram

    (iii) Trellis diagram. (16)

Or

    (b) Write short notes on the following :

    (i) Decoding technique using maximum likelihood (8)

    (ii) Turbo coding (8)

G 6139