Reg. No. : | | | | | | | | | | |

Question Paper Code: 52123

M.E. DEGREE EXAMINATION, DECEMBER 2015

First Semester

COMMUNICATION SYSTEMS

15PCM103 - MODULATION AND CODING TECHNIQUES

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 3 = 15 Marks)

1. Identify the differences between memory less modulation scheme and modulation scheme with memory.
2. State the principle of self-recovering equalization.
3. Write short notes on binary symmetric channel.
4. Illustrate the importance of Trellis coded modulation.
5. Draw a neat schematic diagram of turbo encoder and explain its blocks.

PART - B (5 x 14 = 70 Marks)

6. (a) Derive the Power spectra of CPFSK and CPM signals. (14)

Or

(b) Explain the power spectrum by linear modulation with memory in detail. (14)

7. (a) Explain the LMS algorithm. Also give the various convergence properties of LMS algorithm. (14)

Or

(b) What is adaptive equalization? Explain the Kalman recursive least square algorithm for adaptive equalization. (14)

8. (a) Derive the basic formula for capacity of the band limited AWGN waveform channel with a band limited and average power limited input. (14)

Or

(b) Write short notes on:
(i) Modulation constrained information rate (6)
(ii) Sphere packing and random coding bounds (8)

9. (a) Give the four state Trellis code for 8-PSK modulation. (14)

Or

(b) Derive the eight state Trellis code for coded 8-PSK modulation. (14)

10. (a) Evaluate using mathematical description the soft-output Viterbi algorithm along with its implementation. (14)

Or

(b) Explain turbo coding performance over Rayleigh channels. (14)

PART - C (1 x 15 = 15 Marks)

11. (a) What is set partitioning concept? Using suitable example explain the concept with respect to Trellis coded modulation. (15)

Or

(b) Explain with derivation the modifications of MAP algorithm. (15)