Code No.: 3076

FACULTY OF ENGINEERING

B.E. III/IV Semester (ECE) II Semester (Main) Examination, May/June, 2011

DIGITAL COMMUNICATION SYSTEMS

Time : 3 *Hours*] [*Max. Marks* : 75

Answer all questions from Part A.
Answer any **five** *questions from Part B.*

Part A – (Marks : 25)

1. Discuss the advantage of digital communication over analog communication. 3
2. What is the need of companding in PCM systems? 2
3. Define the following terms : 3
   (a) Entropy (b) Uncertainty (c) Information. 2
4. What do you mean by source coding? 3
5. Give the differences between linear block codes and convolutional codes. 2
6. What is the significance of minimum distance of a block code? 2
7. What is a correlation receiver?
8. Give the comparisons between digital modulation schemes through bandwidth and power requirements. 3
9. Discuss the properties of PN sequence. 3
10. Give the applications of Direct Sequence Special Spectrum. 2

Part B – (Marks : 50)

11. (a) Explain the Adaptive Delta Modulation system with a neat block diagram. 5
    (b) Explain four channel TDM system in detail. 5
12. Explain the procedural steps involved in Huttman coding and perform Huttman coding for the following :

    Let x_1, x_2, x_3, x_4, x_5, x_6, x_7 be the source symbols with probabilities 0.08, 0.08, 0.04, 0.08, 0.2, 0.4 and 0.12. Calculate the efficiency of the coder. 10
13. Construct the standard array for a (6, 3) Linear Block code whose generator matrix is given below :

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 0 & 1 \end{bmatrix}$$

Decode the received vector 010110 using table look up decoding method.

14. (a) Explain binary FSK signalling schemes. Derive the expression for probability of error of coherent FSK signalling scheme. 7

(b) Compare coherent and Non-coherent signalling schemes. 3

15. (a) Explain the tracking and acquisition of FM signals using fine synchronisation. 7

(b) Explain the need for spreading code. 3

16. (a) What is meant by mutual information? Discuss the properties of mutual information in detail. 5

(b) Explain QPSK modulation and demodulation with neat sketches. 5

17. Write short notes on the following : 10

(a) Linear predictive coding.

(b) Synchronization methods.