

FACULTY OF ENGINEERING

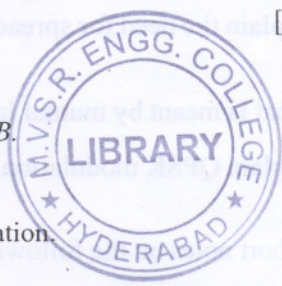
B.E. III/IV Semester (ECE) II Semester (Main) Examination, May/June, 2011

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)**

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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? 3
 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 Spread 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 Huffman coding and perform Huffman 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.