

Code: EC6T4

III B.Tech - II Semester – Regular Examinations – May 2017

**DIGITAL COMMUNICATIONS
(ELECTRONICS & COMMUNICATION ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11x 2 = 22 M

1.

- a) Give the expression for aliasing error and the bound for aliasing error.
- b) The signal to quantization noise ratio in a PCM system depends on what criteria?
- c) How is eye pattern obtained on the CRO?
- d) Why do we go for Gram-Schmidt Orthogonalization procedure?
- e) What is the value of maximum signal to noise ratio of the matched filter? When it becomes maximum?
- f) Write a short note on Information, Entropy and Mutual Information?
- g) What are the error detection and correction capabilities of hamming codes?
- h) What is BCH code?
- i) Compare between code tree and trellis diagram.
- j) State the balance property of random binary sequence.

k) What are the three codes used for the anti jamming application?

PART – B

Answer any *THREE* questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) Explain the Operation of DPCM techniques. List the advantages and disadvantages of it. 8 M

b) Explain the techniques: Quantization and encoding in PCM system. 8 M

3. a) What are different digital modulation techniques available? Compare them with regard to the probability error. 8 M

b) Draw the block diagram of DPSK modulator and explain how synchronization Problem is avoided for its detection. 8 M

4. a) Apply Shannon fano coding for the 5 messages with probabilities 0.4, 0.15, 0.15, 0.15, 0.15 and find the coding efficiency. 8 M

b) What is binary symmetric channel and derive expression for its capacity. 8 M

5. a) Draw the trellis diagram of a Convolutional code of code rate $r=1/2$ and Constraint length of $K=3$ starting from the state table and state diagram for an encoder which is commonly used. 8 M
- b) Explain the sequential decoding for convolutional code in detail. 8 M
6. a) Explain how PN sequences are generated. What are maximal-length sequences? What are their properties and why are they preferred? 8 M
- b) With the help of a neat block diagram, explain the working of a DS spread spectrum based CDMA system. 8 M