

6E3089

Roll No. _____

Total No of Pages: **3****6E3089****B.Tech VI Sem. (Main & Back) Exam., May/June 2013****Applied Elect.****6A14 Digital Communication****Common for 6A14, 6E14****Time: 3 Hours****Maximum Marks: 80****Min. Passing Marks: 24***Instructions to Candidates:*

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal marks**. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1. _____

2. _____

UNIT – I

- Q1. Explain PCM in terms of modulation and demodulation. Derive and state Sampling Theorem. Also explain Compounding. [16]

OR

- Q1: Explain: [16]
- (i) Matched filter Detection
 - (ii) Error probability is PCM system.
 - (iii) ADM & T1 carrier system.

UNIT – II

- Q2. Derive the Nyquist's criterion for distortion-less base band binary transmission in absence of noise. Also, explain bipolar & manchester coding.

OR

- Q2. Explain Inter symbol Interference. Also, explain raised cosine spectrum.

UNIT – III

- Q3. Draw and explain ASK, BPSK, FSK, QPSK, MSK modulation techniques. Also explain coherent detection of these techniques.

OR

- Q3. Calculate the error probabilities for various modulation techniques (i.e. ASK, FSK, PSK). Also explain orthogonalization.

UNIT – IV

- Q4. Explain
- (i) Average information
 - (b) Entropy
 - (c) Information rate
 - (d) Shannon's Theorem. rtuonline.com

Find the Shannon limit for channel having infinite bandwidth.

OR

- Q4. Consider a discrete memory less source with entropy $H(S)$. Show that $H(S)$ is bounded as follows.

$0 \leq H(S) \leq \log_2 k$ where k is radix of alphabets of the source. Also explain Huffman coding.

UNIT - V

- Q5. Given a generator polynomial

$$g(D) = 1 + D + D^3 \text{ of}$$

a (7,4) cyclic code, Construct the 4-by-7 generator matrix G and draw the encoder for this cyclic code, Show the contents of shift register in the encoder for message sequence 1001.

OR

- Q5. Explain and compare cyclic code and convolutional code. Also, explain their encoding and decoding techniques.
