

6E3089

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B. Tech. VI Semester (Main/Back) Exam. May/June, 2013

ELECTRONICS & COMMUNICATION ENGINEERING # 6EC4

DIGITAL COMMUNICATION

Time : 3 Hours

Min. Passing Marks : 24

Maximum Marks : 80

Instruction 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.)

Unit-I

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

OR

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

Unit-II

2. Derive the Nyquist's criterion for distortion-less base band binary transmission in absence of noise. Also, explain bipolar & manchester coding. [16]

OR

2. Explain Inter symbol Interference. Also, explain raised cosine spectrum. [16]

Unit-III

3. Draw and explain ASK, BPSK, FSK, QPSK, MSK modulation techniques. Also explain coherent detection of these techniques. [16]

OR

3. Calculate the error probabilities for various modulation techniques (i.e. ASK, FSK, PSK). Also explain orthogonalization. [16]

Unit-IV

4. Explain : [16]

- (i) Average information
(ii) Entropy.
(iii) Information rate
(iv) Shannon's Theorem.

Find the Shannon limit for channel having infinite bandwidth.

OR

4. 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. [16]

Unit-V

5. Given a generator polynomial $g(D) = 1 + D + D^3$ 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. [16]

OR

5. Explain and compare cyclic code and convolutional code. Also, explain their encoding and decoding techniques. [16]