

6E3089**6E3089****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]