R13

SET - 1

III B. Tech II Semester Supplementary Examinations, November - 2018
DIGITAL COMMUNICATIONS
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
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PART –A

1	a)	Define quantization noise.	[3M]
	b)	Draw the BASK waveform for the data **1 0 1 1 1 0 1 0 1**, using bipolar signaling.	[4M]
	c)	Give the expression for minimum probability of error of a matched filter.	[3M]
	d)	Define i) Information ii) Information rate.	[4M]
	e)	What is the tradeoff between bandwidth and SNR.	[4M]
	f)	List different types of channel codes.	[4M]

PART -B

2   a)   Find a signal $g(t)$ that is band-limited to B Hz and whose samples are   [8M]
$$g(0) = 1 \ and \ g(\pm T_s) = g(\pm 2T_s) = g(\pm 3T_s) = \cdots = 0$$
where the sampling interval T_s is the Nyquist interval for $g(t)$, that is, $T_s = \frac{1}{2B}$.

b)   Draw the block diagram of PCM system and explain.   [8M]

3   a)   Draw the block diagram of coherent binary PSK detector and explain its operation.   [8M]
b)   Explain the process of differential encoding and detection of binary DPSK with the   [8M]
following data: [1 0 1 0 0 1 1 1 0 0].

4   a)   Plot and compare the probability of error for the non-coherent detection of binary   [8M]
ASK and binary FSK.
b)   Explain the operation of integrate-and-dump filter.   [8M]

5   a)   A memoryless source emits 0.3, 0.25, 0.15, 0.12, 0.1, and 0.08. Find the entropy of   [8M]
this source.
b)   Define the following: [8M]
i) Amount of information
ii) Average information
iii) Mutual information
iv) Information rate

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6   a)   A source emits seven messages with probabilities 1/2, 1/4, 1/8, 1/16, 1/32, 1/64,   [8M]
          and 1/64, respectively. Obtain the Huffman code and find the average length of the
          codeword.
    b)   Write notes on Shanon-Fano coding.   [8M]

7   a)   The decoding table for the single-error correcting (7, 4) code is given in Table.   [8M]
          Determine the data vectors transmitted for the following received vectors r :
          i) 1101101
          ii) 0101000
          iii) 0001100

e	s
1000000	110
0100000	011
0010000	111
0001000	101
0000100	100
0000010	010
0000001	001

    b)   Write notes on Viterbi algorithm.   [8M]

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