Code: 15A04502 **R15**

B.Tech III Year I Semester (R15) Supplementary Examinations June 2018

DIGITAL COMMUNICATION SYSTEMS

(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) Differentiate uniform and non-uniform quantization.
(b) What is the role of regenerative repeaters in PCM?
(c) State the properties of matched filter.
(d) What is ISI?
(e) Illustrate the geometric representation of energy signals for a two-dimensional signal space with three signals, that is, N = 2 and M = 3.
(f) With a neat diagram, explain the vector receiver part of the correlation receiver.
(g) Draw the block diagram for QPSK receiver.
(h) Plot the BPSK signal for the given sequence 0010110010.
(i) What is the difference between block code and convolution code?
(j) Find the hamming distance between 101010 and 010101.If the minimum hamming distance of a (n, k) linear block code is 3, what is its minimum hamming weight?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 With neat block diagram, explain the PCM communication system.

OR

3 With a neat block diagram, explain the delta modulation and demodulation also discuss the types of quantization errors occurring in it.

UNIT – II

4 Discuss about the Nyquist's criterion for distortion less base band binary transmission.

OR

5 Explain briefly about baseband M array PAM transmission.

UNIT – III

6 Explain the methods to find basis function in Gram-Schmidt Orthogonalization procedure.

OR

7 What is matched filter receiver? Obtain the impulse response of the matched filter.

UNIT – IV

8 Discuss about the bit error probability and power spectra of BPSK signal.

OR

9 With block diagram, explain the generation and detection of DPSK.

UNIT – V

10 Consider a (6, 3) linear block code whose generator matrix is:

$$G = \begin{bmatrix} 1 & 1 & 0 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 0 & 1 \end{bmatrix}$$

(i) Determine if the code is a Hamming code. Find the parity check matrix H of the code in systematic form. (ii) Find the encoding table for the linear block code. (iii) What is the minimum distance d_{min} of the code? How many errors can the code detect? How many errors can the code correct? (iv) Find the decoding table for the linear block code.

OR

11 A convolutional encoder has single shift register with two stages three modulo-2 adders and an output multiplexer. The following generator sequences are combined by the multiplexer to produce the encoded output.

$g_1 = (1,0,1)$; $g_2 = (1,1,0)$; $g_3 = (1,1,1)$

(i) Draw the block diagram of the encoder
(ii) For the message sequence (10011), determine the encoded sequence.

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