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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations December-2021

DIGITAL COMMUNICATIONS

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

- 1 a Explain the delta modulation system with suitable diagrams. L2 6M
b List the Advantages of DM. L1 6M

OR

- 2 a State sampling theorem. L1 6M
b Consider an audio signal consisting of the sinusoidal term given as $x(t) = 3\cos$ (500pt). i) Determine the SNR noise ratio. when this is quantized using 10 bits PCM. ii) How many bits of quantization are needed to achieve a SNR ratio of at least 40dB? L5 6M

UNIT-II

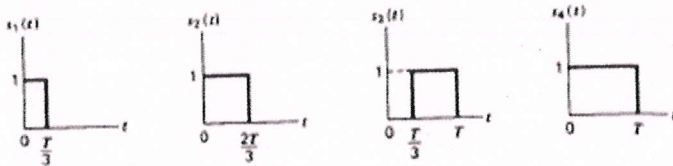
- 3 a Derive the expression for impulse response of a matched filter. L4 6M
b Describe the baseband M-array PAM Transmission system. L1 6M

OR

- 4 a What is ISI? Draw the basic block diagram of baseband binary data transmission. L1 6M
b Explain the rectangular pulse for a matched filter. L2 6M

UNIT-III

- 5 Consider the signals $s_1(t)$, $s_2(t)$, $s_3(t)$, $s_4(t)$, shown in fig. Find the orthogonal basis function using Gram Schmidt orthogonalization procedure. L5 12M



OR

- 6 Explain the following L2 12M
i) Additive White Gaussian noise. ii) Orthogonality.
iii) Signal vector. iv) Synthesizer.

UNIT-IV

- 7 a Compare all the digital modulation techniques. L2 6M
b Sketch with a neat diagram of M-array PSK transmitter and receiver. L3 6M

OR

- 8 a Describe the generation and detection of DPSK. L2 6M
b A binary data stream 101101100 is to be transmitted using DPSK. Determine the encoded and decoded output. Draw the block diagram of QPSK transmitter & receiver and explain each block in detail. L3 6M

UNIT-V

9 The Generator matrix (G) for a (7, 4) block code is given below

L3 12M

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

Find the Parity check matrix (H). Find code vectors for any eight messages.

OR

10 a Explain the Convolutional Encoding and Decoding methods.

L2 6M

b Discuss in brief about sequential decoding of convolutional codes.

L2 6M

*** END ***