

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

**B.Tech II Year II Semester Regular & Supplementary Examinations August-2023**  
**DIGITAL COMMUNICATIONS**

(Electronics & Communications Engineering)

**Time: 3 Hours**

**Max. Marks: 60**

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

**UNIT-I**

- |   |   |     |    |    |
|---|---|-----|----|----|
| 1 | a With a neat block diagram explain PCM transmitter and receiver. | CO1 | L2 | 8M |
|   | b What are the advantages & disadvantages of PCM?                 | CO1 | L1 | 4M |

OR

- |   |  |     |    |    |
|---|--|-----|----|----|
| 2 | a Explain the DM (delta modulation system) with suitable diagrams. | CO1 | L2 | 8M |
|   | b Explain Slope overload Distortion & Granular Noise.              | CO5 | L2 | 4M |

**UNIT-II**

- |   |   |     |    |     |
|---|---|-----|----|-----|
| 3 | A polar NRZ waveform has to be received into the help of a matched filter. Here binary '1' is represented as a rectangular positive pulse. Also, binary '0' is represented by a rectangular negative pulse. determine the impulse response of the matched filter. Also sketch it. | CO6 | L3 | 12M |
|---|---|-----|----|-----|

OR

- |   |   |     |    |     |
|---|---|-----|----|-----|
| 4 | Derive the expression for the Nyquist criterion for distortion less baseband Transmission in the absence of noise in terms of time domain & Frequency domain. | CO2 | L3 | 12M |
|---|---|-----|----|-----|

**UNIT-III**

- |   |                                  |     |    |     |
|---|----------------------------------|-----|----|-----|
| 5 | Explain the following            | CO4 | L2 | 12M |
|   | i) Additive White Gaussian noise |     |    |     |
|   | ii) Orthogonality                |     |    |     |
|   | iii) Signal vector               |     |    |     |
|   | iv) Synthesizer                  |     |    |     |

OR

- |   |  |     |    |     |
|---|--|-----|----|-----|
| 6 | Draw the block diagram of the structure and behavior of Matched filter Receiver. | CO5 | L1 | 12M |
|---|--|-----|----|-----|

**UNIT-IV**

- |   |   |     |    |    |
|---|---|-----|----|----|
| 7 | a Draw the block diagram of ASK transmitter and receiver and explain the operation. | CO3 | L1 | 6M |
|   | b Derive an expression for probability of error of coherent binary ASK.             | CO5 | L3 | 6M |

OR

- |   |  |     |    |    |
|---|--|-----|----|----|
| 8 | a Compare all the digital modulation techniques              | CO3 | L2 | 6M |
|   | b Derive the probability of error for a coherent QPSK system | CO5 | L3 | 6M |

**UNIT-V**

- |   |   |     |    |    |
|---|---|-----|----|----|
| 9 | a Explain the concept of matrix representation of Linear block codes. | CO4 | L2 | 6M |
|   | b Describe the Error detection and correction codes.                  | CO4 | L2 | 6M |

OR

- |    |  |     |    |     |
|----|--|-----|----|-----|
| 10 | For a systematic (7, 4) linear block code the sub matrix 'P' is given as | CO3 | L5 | 12M |
|----|--|-----|----|-----|

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

Detect & correct the error using syndrome vector for the given code vector

$$Y_A = [0111110] \quad Y_B = [1011100] \quad Y_C = [1010000]$$

\*\*\* END \*\*\*

