



MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

II B.Tech II Sem Regular End Examination, July 2022

Analog and Digital Communications

(ECE)

Time: 3 Hours.

Max. Marks: 70

Note: 1. Question paper consists: Part-A and Part-B.

2. In Part - A, answer all questions which carries 20 marks.

3. In Part - B, answer any one question from each unit.

Each question carries 10 marks and may have a, b as sub questions.

PART- A

(10*2 Marks = 20 Marks)

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|-------|---|----|-----|-----|
| 1. a) | Define and discuss the need for modulation. | 2M | C01 | BL1 |
| b) | Draw the standard amplitude modulated waveform for a single tone message signal with various different values of modulation index 0.25, 0.75 and 1. | 2M | C01 | BL2 |
| c) | Compute the bandwidth of FM for a frequency deviation of 75 kHz and maximum modulating signal frequency of 15kHz. | 2M | C02 | BL2 |
| d) | Give the comparison of TDM and FDM. | 2M | C02 | BL1 |
| e) | Draw the block diagram of a digital communication system. | 2M | C03 | BL2 |
| f) | Illustrate the importance of eye diagrams in analysis of digital communication system | 2M | C03 | BL3 |
| g) | Compare the coherent and non-coherent methods for demodulation of band pass data transmission. | 2M | C04 | BL1 |
| h) | Give the bit rate for ASK, FSK, PSK and M-ary schemes. | 2M | C04 | BL2 |
| i) | List the properties of narrow band representation of noise. | 2M | C05 | BL1 |
| j) | Define amount of information, entropy and channel capacity. | 2M | C05 | BL2 |

PART- B

(10*5 Marks = 50 Marks)

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|------|--|----|-----|-----|
| 2 a) | Explain the generation of AM wave using switching modulator. | 5M | C01 | BL4 |
| b) | Illustrate the demodulation of SSB-SC using synchronous demodulator. | 5M | C01 | BL2 |

OR

- | | | | | |
|------|---|-----|-----|-----|
| 3 | Draw and explain the block diagram of super heterodyne receiver. Elaborate the discussion on envelope detector. | 10M | C01 | BL4 |
| 4 a) | Explain the generation of FM using Armstrong method. | 5M | C02 | BL4 |
| b) | Discuss the demodulation of FM using balanced slope detector. | 5M | C02 | BL2 |

OR

- 5 Show that wide band FM has infinity sidebands, infinity bandwidth and has constant average power. 10M C02 BL3
- 6 a) Draw the modulated waveforms of PAM, PWM and PPM for a single message signal. 5M C03 BL1
b) Show that the matched filter receiver is an optimum receiver in terms of signal to noise ratio. 5M C03 BL3
- OR**
- 7 Evaluate the performance of PCM, DPCM, DM and ADM with reference to noise considerations. 10M C03 BL5
- 8 a) Describe the generation and demodulation of FSK modulated signal. 5M C04 BL2
b) Compare the performance of all band pass transmission techniques with reference to bandwidth and probability of error. 5M C04 BL2
- OR**
- 9 Derive an equation for probability of error for a coherent and non-coherent PSK demodulator 10M C04 BL6
- 10 a) Compute the figure of merit of standard AM using envelope detector. 5M C05 BL3
b) Illustrate the role of error detection and correction in the design of a digital communication receiver. 5M C05 BL4
- OR**
- 11 With considering a suitable example describes the process of linear block and hamming codes. 10M C05 BL2