

Reg. No: 

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

**B.Tech III Year I Semester Regular Examinations March-2023**

**INTRODUCTION TO COMMUNICATION SYSTEMS**

(Open Elective-I)

Time: 3 hours

Max. Marks: 60

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

**UNIT-I**

- 1 a Determine the modulation index of AM, Percentage Modulation and Bandwidth of AM. CO3 L3 6M
- b A modulating signal  $5 \cos(2\pi \times 103t)$  is used to modulate a carrier signal  $10 \cos(2\pi \times 104t)$ . Compute the modulation index, % of modulation index, frequency of sideband components and their amplitudes. CO3 L2 6M

OR

- 2 a Examine the various applications of SSB-SC. CO3 L3 6M
- b Explain single tone modulation for transmitting only lower side band(LSB) frequency of SSB modulation. CO3 L2 6M

**UNIT-II**

- 3 a Discuss about transmission bandwidth and Carson's rule of FM signal. CO2 L2 6M
- b A 20 MHz carrier is frequency modulated by a sinusoidal signal such that the peak frequency deviation is 100 kHz. Determine the modulation index and the approximate bandwidth of the FM signal if the frequency of the modulating signal is: (i) 1kHz (ii) 15 kHz CO3 L3 6M

OR

- 4 a Describe the functionality of each block of phase shift discriminator. CO2 L2 6M
- b Explain briefly about Phase Modulation with necessary waveforms. CO2 L2 6M

**UNIT-III**

- 5 a Calculate the input signal to noise ratio for an amplifier with an output signal to noise ratio of 16 dB and a noise figure of 5.4 dB. CO1 L4 6M
- b Explain Pulse Amplitude modulation with its waveforms. CO3 L2 6M

OR

- 6 a Explain the process involved in generation of PPM wave. CO3 L2 6M
- b Describe the demodulation technique of PWM signal. CO3 L1 6M

**UNIT-IV**

- 7 a Define Digital Communication and draw the basic block diagram of Digital communication system. CO4 L1 6M
- b Explain the function of each block of Digital communication system. CO1 L2 6M

OR

- 8 a Draw the block diagram of BPSK modulator and explain the operation. CO6 L2 6M
- b Discuss in brief about BPSK coherent Demodulator using a neat block diagram. CO6 L2 6M

**UNIT-V**

- 9 a Discuss briefly about the evolution of Mobile radio communication. CO6 L2 6M
- b Explain paging systems. CO6 L2 6M

OR

- 10 a Explain the multiple access schemes for wideband systems. CO6 L2 6M
- b Discuss about frequency division duplexing in wireless communication. CO6 L2 6M

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INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR

(AUTONOMOUS)

5th Semester Regular Examinations March-2023

APPLICATION TO COMMUNICATION SYSTEMS

(Open Elective-I)

163

Max. Marks: 60

Time: 3 hours

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

UNIT-I

- 1 a) Determine the modulated index of AM Percentage Modulation and Bandwidth of 1000 Hz.
- b) A modulating signal  $m(t) = 10 \cos(2\pi \times 1000t)$  is used to modulate a carrier signal  $10 \cos(2\pi \times 10^5 t)$ . Compute the modulation index, % of modulation index, frequency of sideband components and their amplitudes.

- 2 a) Explain the various applications of SSB-SC.
- b) Explain single tone modulation for transmitting only lower side band (LSB) frequency of SSB modulation.

UNIT-II

- 2 a) Discuss about transmission bandwidth and Carson's rule of FM signal.
- b) A 50 kHz carrier is frequency modulated by a sinusoidal signal such that the peak frequency deviation is 100 kHz. Determine the modulation index and the approximate bandwidth of the FM signal if the frequency of the modulating signal is 10 kHz.

OR

- 1 a) Describe the frequency of each block of phase shift discriminator.
- b) Explain briefly about Phase Modulation with necessary waveforms.

UNIT-III

- 2 a) Calculate the time ratio to noise ratio for an amplifier with an output signal to noise ratio of 10 dB and a noise figure of 2.4 dB.
- b) Explain Pulse Amplitude Modulation with its waveforms.

OR

- a) Explain the process involved in generation of PWM wave.
- b) Describe the demodulation technique of PWM signal.

UNIT-IV

- 7 a) Define Digital Communication and draw the basic block diagram of Digital communication system.

- b) Explain the function of each block of Digital communication system.

OR

- 8 a) Draw the block diagram of BPSK modulator and explain the operation.
- b) Draw the block diagram of BPSK coherent demodulator using a neat block diagram.

UNIT-V

- 9 a) Discuss briefly about the evolution of Mobile radio communication.
- b) Explain paging systems.

OR

- 10 a) Explain the multiple access schemes for wireless systems.
- b) Discuss about frequency division duplexing in wireless communication.