

Reg. No:

--	--	--	--	--	--	--	--	--	--

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

B.Tech III Year I Semester Supplementary Examinations November-2020

ANALOG COMMUNICATIONS

(Electronics & Communication Engineering)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

- 1 a What is meant by modulation and explain the benefits of modulation. **6M**
b Derive an expression for the power content and transmission efficiency of single tone AM signal. **6M**

OR

- 2 a Explain Synchronous detection for SSB-SC **5M**
b With the help of circuit diagram explain the operation of square-law diode modulator & demodulator for AM. **7M**

UNIT-II

- 3 a Explain the generation of Narrowband Frequency Modulation and Narrowband Phase Modulation with suitable block diagrams. **6M**
b Write short note on Pre-emphasis and De-emphasis circuits. **6M**

OR

- 4 a With the necessary circuit and voltage to frequency characteristics, explain the functionality of balanced slope detector for FM. **6M**
b A 107.76MHz carrier signal is frequency modulated by a 7kHz sine wave. The resultant FM signal has a frequency deviation of 50kHz. Determine carrier swing, highest & lowest frequencies of frequency modulated signal, and modulation index of FM wave. **6M**

UNIT-III

- 5 a Discuss about different sources of noise. **6M**
b What is meant by narrow band noise and explain time domain representation of Narrow-band noise. **6M**

OR

- 6 a Obtain the expression for output SNR of FM system. **7M**
b A radio receiver with 10KHz bandwidth has a noise figure of 30dB. Determine the signal power required at the input of receiver to achieve input SNR at 30dB. **5M**

UNIT-IV

- 7 a State and prove sampling theorem & its reconstruction for low-pass signals. **6M**
b Explain the demodulation of PAM signals. **6M**

OR

- 8 a Explain about demodulation of PPM signal. **7M**
b For a pulse-amplitude modulated transmission of voice signal having maximum frequency equal to 3kHz, calculate the transmission bandwidth. It is given that the sampling frequency 8kHz and pulse duration $0.1T_s$. **5M**

UNIT-V

- 9 a Explain Super-heterodyne FM receiver **6M**
b For a broadcast Super-heterodyne AM receiver having no RF amplifier, the loaded Quality factor of the antenna coupling circuit is 100. Now, if the intermediate frequency is 455kHz, determine the image frequency and its rejection ratio at an incoming frequency 1000kHz. **6M**

OR

- 10 a Explain Shannon's encoding algorithm. **6M**
b Explain Entropy, Information rate, Channel capacity theorem, Mutual information. **6M**

*** END ***