Q.P. Code: 19EC0408 **R19**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations February-2022

ANALOG COMMUNICATIONS

(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 60

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

UNIT-I

1	a	Define modulation? Explain the NEED for Modulation.	**6M**
	b	An AM transmitter radiates 9kW of power when the carrier is un modulated and 10.125kW of power when the carrier is sinusoidal modulated. Find the modulation index & Percentage modulation. Now if another sine wave corresponding to 40% modulation is transmitted Simultaneously. Calculate total radiated power	**6M**

OR

2	a	How a modulating signal can be detected using ENVELOP DETECTOR and explain.	**6M**
	b	A modulating signal 10 Sin($2\pi\times103$ t) is used to modulate a carrier signal 20sin($2\pi\times104$ t). Determine the modulation index, % of modulation index, frequency of sideband components and their amplitudes. What will be the bandwidth of modulated signal?	**6M**

UNIT-II

3	a	With a neat block diagram, explain the BALANCED MODULATOR method for generating DSB-SC wave.	**6M**
	b	Define Hilbert Transform? Explain the time and frequency domain expressions of Hilbert transform	**6M**

OR

4	a	Explain VSB modulation? Mention the advantages and applications of VSB modulation.	**6M**
	b	Consider a two stage SSB modulator where the message signal occupies a band 0.3khz to 4khz and two carrier frequencies are f1=10khz and f2=100khz.Evaluate i) side bands of DSCB-SC at output of product modulators ii)side bands of SSB-SC at output of band pass filter.	**6M**

UNIT-III

5	a	Explain the generation of Narrowband Frequency Modulation and Narrowband Phase Modulation with suitable block diagrams.	**6M**
	b	A single-tone FM is represented by the voltage equation as: $v\,(t) = 12cos\,(6 \times 106t + 5sin\ 1250t)$ Determine the following: (i) Carrier frequency (ii) Modulating frequency (iii) Modulation index	**6M**

OR

6	a	Explain and draw the neat block diagram of the FM generator using indirect FM method.	**6M**
	b	Compare slope detector and balanced slope detector.	**6M**

UNIT-IV

7	a	Draw block diagram of Super-heterodyne AM receiver and explain function of each block		6M
	b	Compare the noise performance in frequency modulated system and amplitude modulated system.		6M
		OR		
8	a	Explain about sensitivity, selectivity and fidelity.		6M
	b	Obtain the expression for output SNR of FM system.		6M

UNIT-V

9	a	Explain generation of PAM with mathematical analysis		6M
	b	Explain Entropy, Information rate, Channel capacity theorem, Mutual information.		6M
		OR		
10	a	With block diagram explain the generation of PWM signals.		6M
	b	A voice grade telephone channel has a bandwidth of 3400Hz. If the signal to noise ratio on the channel is 30dB, determine the capacity of the channel. If the above channel is to be used to transmit 4.8kbps of data determine minimum SNR required on the channel.		6M

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