Q.P. Code: 18EC408 **R18**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations March 2021

ANALOG COMMUNICATIONS

(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 60

PART-A

(Answer all the Questions **5 x 2 = 10** Marks)

1	a	Write about Synchronous detection for SSB-SC.	2M
	b	Describe zero crossing detector.	2M
	c	Describe noise equivalent bandwidth.	2M
	d	Explain how PPM can be generated from PWM signals.	2M
	e	Explain Shannon's encoding algorithm.	2M

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	Explain radio frequency spectrum & its application used in communication system with a neat sketch.	5M
	b	Draw the neat circuits and equivalent circuits (for different modes) of ring modulator using diodes for generating DSB-SC signal.	5M
		OR	
3	a	What is meant by modulation and explain the benefits of modulation.	5M
	b	Derive an expression for SSB-SC wave using the concept of pre-envelope.	5M

UNIT-II

4	a	Explain the generation of Narrowband Frequency Modulation and Narrowband Phase Modulation with suitable block diagrams.	5M
	b	With the necessary circuit and voltage to frequency characteristics, explain the functionality of balanced slope detector for FM.	5M
		OR	
5	a	Expand the expression for FM signal in terms of Bessel functions.	5M
	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.	5M

UNIT-III

6	a	What is meant by narrow band noise and explain time domain representation of narrow-band noise.	5M
	b	Obtain the expression for output SNR of FM system.	5M
		OR	
7	a	If each stage has a gain of 10dB and noise figure of 10dB. Calculate the overall noise figure of a two-stage cascaded amplifier.	6M
	b	Explain the noise performance of DSB-SC scheme with the help of neat block diagram.	4M

UNIT-IV

8	a	Explain the frequency spectrum of Flat Top PAM signal.	6M
	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 0.1Ts.	4M

OR

9	a	Explain about advantages and disadvantages for PAM. And about synchronization in PAM.	5M
	b	With block diagram explain the generation of PWM signal.	5M

UNIT-V

10	a	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 of 1000kHz	5M
	b	A Discrete source emits one of 5 symbols once every millisecond. The symbol Probabilities are 1/2, 1/4, 1/8, 1/16 and 1/16. Find entropy and information rate.	5M

OR

11	a	Explain Super-heterodyne FM receiver and mention its disadvantage of Super-heterodyne AM receiver.	5M
	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.	5M

END