O.P.Code: 23EC0409	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Regular & Supplementary Examinations March/April-2026
ANALOG AND DIGITAL COMMUNICATIONS
(Electronics & Communications Engineering)

Time: 3 Hours **Max. Marks: 70**

PART-A

(Answer all the Questions **10 x 2 = 20** Marks)

1	a	Determine Bandwidth of AM.	CO5	L3	2M
	b	What are the advantages of DSB-SC.	CO5	L1	2M
	c	Define frequency deviation.	CO1	L2	2M
	d	Define Pre-Emphasis and De-Emphasis.	CO2	L2	2M
	e	What are the basic functions of a Transmitter and Receiver?	CO2	L1	2M
	f	Define Intermediate frequency and Image frequency.	CO2	L1	2M
	g	What is Thermal Noise?	CO4	L1	2M
	h	List the Advantages of Delta Modulation.	CO5	L1	2M
	i	Define inter symbol interference.	CO6	L1	2M
	j	What are the coherent digital modulation techniques?	CO5	L1	2M

PART-B

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

UNIT-I

2	a	Classify different types of modulation.	CO2	L1	5M
	b	Explain need for Modulation.	CO2	L2	5M
		OR			
3	a	Sketch and explain the block diagram of SSB-SC signal generation using frequency discrimination method.	CO1	L3	5M
	b	A message signal $m(t)=\cos(2\pi\times 1\times 10^3 t)$ is used to generate an upper-sideband (USB) SSB-SC signal with a carrier frequency fc=100kHz. Find the SSB-SC transmitted sign.	CO5	L3	5M

UNIT-II

4	a	Analyze the expression of single tone FM.	CO5	L4	5M
	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) 1 kHz (ii) 15 kHz.	CO2	L3	5M
		OR			
5		Explain the block diagram of indirect method in FM generation.	CO2	L2	10M

UNIT-III

6	a	Draw a neat block diagram of an FM transmitter and explain each block.	CO5	L1	5M
	b	Explain the concept of frequency stability in the FM transmitter.	CO2	L2	5M
		OR			
7	a	Draw the block diagrams of a super hetrodyne receiver and explain the function of each block.	CO5	L1	5M
	b	What are the advantages of a super hetrodyne receiver as compared to a TRF receiver?	CO2	L1	5M

UNIT-IV

8	a	Derive the expression for output SNR of DSB-SC system.	CO4	L3	5M
	b	Prove that the figure of merit for SSB-SC is 1.	CO4	L3	5M
		OR			
9	a	Differentiate between TDM & FDM.	CO4	L2	4M
	b	With a neat block diagram explain PCM transmitter and receiver.	CO5	L2	6M

UNIT-V

10		Draw the block diagram of ASK transmitter and receiver and explain the operation.	CO5	L1	10M
		OR			
11	a	What is an Optimum Receiver? Explain how it is designed for different modulation techniques.	CO6	L1	5M
	b	Discuss the significance of Coherent Reception in digital communication systems.	CO6	L2	5M

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