O.P.Code: 23EC0459	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. II Year II Semester Regular Examinations July/August-2025

ANALOG CIRCUITS

(Electrical & Electronics Engineering)

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

PART-A

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

1	a	Discuss the need of biasing of a transistor.	CO1	L2	2M
	b	Define operating point.	CO1	L1	2M
	c	List the characteristics of negative feedback amplifiers.	CO2	L1	2M
	d	Sketch the Equivalent circuit of a transistor using h-Parameters.	CO2	L1	2M
	e	What is the necessary condition for sustained oscillations?	CO1	L1	2M
	f	Define op-amp.	CO1	L1	2M
	g	What are the types of Multivibrators?	CO1	L1	2M
	h	Define common mode Rejection Ratio.	CO1	L1	2M
	i	Draw the pin configuration of 555 timer.	CO2	L1	2M
	j	List out the examples of digital phase detectors.	CO1	L2	2M

PART-B

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

UNIT-I

2	a	List out the different types of clipping and clamping circuits.	CO1	L1	5M
	b	Explain the concept of DC and AC Load lines and discuss the Criteria for fixing the Q-point.	CO2	L2	5M
		OR			
3	a	Compare the various biasing techniques of a BJT.	CO2	L2	5M
	b	Draw the collector to base bias circuit and derive an expression for the stability factor.	CO3	L3	5M

UNIT-II

4		Derive the equations for voltage gain, current gain, Input impedance, and output Impedance for a BJT using Approximate model in CC configuration.	CO3	L4	10M
		OR			
5	a	Sketch the four types of feedback amplifier topologies.	CO2	L3	5M
	b	Describe the effect of input resistance for Voltage shunt feedback amplifier.	CO3	L2	5M

UNIT-III

6	a	Determine the frequency of oscillations when an RC phase shift oscillator has R=10 kΩ, C=0.01μF and RC = 2.2 kΩ.	CO6	L3	5M
	b	Explain the working principle of Wein-bridge oscillator using BJT and Derive the expression for frequency of sustained oscillations.	CO3	L4	5M
		OR			
7	a	In a Wien bridge oscillator, if the value of R is 100 kΩ and frequency of oscillation is 10kHz, examine the value of capacitor C.	CO6	L3	6M
	b	Draw the schematic symbol of an op-amp and list the different terminals with their features.	CO1	L1	4M

UNIT-IV

8	a	Design a differentiator circuit with sine wave input using op-amp.	CO5	L6	6M
	b	Design an op-amp differentiator that will differentiate an input signal v =100 Hz.	CO6	L6	4M

OR

9	a	Explain the operation of monostable multivibrator using op-amp ,with a neat circuit and its waveforms.	CO6	L2	5M
	b	Draw the circuit diagram of Non-Inverting comparator & explain its operation.	CO4	L2	5M

UNIT-V

10	a	Explain in detail about R-2R DAC with a neat diagram.	CO4	L2	5M
	b	Discuss the parameters specifications of DAC/ADC.	CO4	L2	5M

OR

11	a	Draw a neat circuit of astable multivibrator using 555 IC and explain operation with waveforms.	CO5	L2	5M
	b	Explain about PLL principle in detail and block diagram.	CO5	L2	5M

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