O.P.Code: 23EC0412	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. III Year I Semester Regular Examinations December-2025

ANALOG AND DIGITAL IC APPLICATIONS

(Electronics & Communications Engineering)

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

PART-A

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

1	a	Define an Integrated circuit.	CO1	L1	2M
	b	State CMRR.	CO1	L1	2M
	c	Define Virtual Ground property.	CO2	L1	2M
	d	What is a Schmitt Trigger?	CO3	L1	2M
	e	Define filter.	CO4	L1	2M
	f	Write the function of a phase detector.	CO4	L1	2M
	g	What is voltage regulator?	CO5	L1	2M
	h	Define ADC.	CO5	L1	2M
	i	Define PMOS.	CO6	L1	2M
	j	What is an Encoder?	CO6	L1	2M

PART-B

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

UNIT-I

2	a	Represent the symbol of IC 741 op-amp and Mention the 8 pins..	CO1	L1	3M
	b	Draw the Symbol of an Op-Amp and Describe about the Op-Amp.	CO1	L2	7M
		OR			
3	a	Illustrate the internal circuit of an operational amplifier	CO1	L2	3M
	b	Illustrate the block diagram of an operational amplifier and discuss the role of its different stages.	CO1	L2	7M

UNIT-II

4	a	Illustrate the inverting subtractor using an op-amp, derive the mathematical expression for Vout and explain its principle.	CO2	L3	5M
	b	With the help of an op-amp, derive the working equation for a non-inverting subtractor circuit and discuss its principle.	CO2	L3	5M
		OR			
5	a	Describe the principle of a sample and hold circuit with the help of a neat circuit diagram.	CO3	L2	5M
	b	How logarithmic and antilogarithmic amplifiers are implemented using op-amps? Draw and explain their circuits.	CO3	L3	5M

UNIT-III

6	a	Explain about the High Pass Filter.	CO4	L2	4M
	b	Design a 1st Order High Pass Butterworth Filter using an Op-Amp with Expressions.	CO4	L3	6M
		OR			
7	a	Design a Low pass filter at a cutoff frequency of 10KHZ with a passband gain of 2.	CO4	L3	5M
	b	Design a wideband pass filter having fL=400HZ fH=2KHZ pass band gain of 4.Draw the frequency response of the filter and calculate the Q Value of the filter.	CO4	L4	5M

UNIT-IV

8	a	Draw and Analyze about the Series Op-Amp Regulator.	CO5	L4	5M
	b	Explain about the Voltage Regulator.	CO5	L4	5M
		OR			
9	a	For a Dual slope ADC VR=100mv t1=50msec and clock frequency is 12KHZ find the digital output for an input voltage of 200mv.	CO5	L5	5M
	b	An 8-bit has resolution of 20mv/LSB. find its VOFS and VO if the input is (10000000)2 .	CO5	L5	5M

UNIT-V

10	a	Draw and Explain about the NMOS Transistors.	CO6	L3	5M
	b	Draw and Explain about the Basic CMOS Inverter.	CO6	L3	5M
		OR			
11	a	Draw and Explain about the Priority Encoder.	CO6	L2	5M
	b	Define Multiplexer and Explain any one of the Multiplexer with truth table.	CO6	L1	5M

***** END *****