Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025

Fourth Semester

Electronics and Communication Engineering

EC3451 – Linear Integrated Circuits

Regulations - 2021

Duration : 3 Hrs *Maximum : 100 Marks*

*PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)*

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	Mention the ideal characteristics of operational amplifiers.	L1	1	2
2.	Define Slew rate.	L1	1	2
3.	Draw the circuit diagram of voltage follower.	L3	2	2
4.	Write down the applications of precision rectifier.	L1	2	2
5.	Define capture range and lock range of PLL.	L2	3	2
6.	Draw the circuit diagram of AM detector using PLL.	L3	3	2
7.	Estimate the conversion time of a 10-bit successive approximation Analog to Digital Converter, if the input clock is 5 MHz.	L3	4	2
8.	Which ADC is fastest and why?	L2	4	2
9.	Name the various protection circuits used for voltage regulators.	L1	5	2
10.	Mention the features of isolation amplifier.	L1	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)*

Q.No		*Questions*	*BLT*	*CO*	*Marks*
11.	a	Construct the BJT differential amplifier with active load and explain its operating principle.	L2	1	16
		Or			
	b	Explain the DC characteristics of operational amplifier with relevant illustrations.	L2	1	16
12.	a	With neat diagram, explain the operation of Instrumentation amplifier using 3 Op-amp and derive expression for overall gain. Also specify the important features of an instrumentation amplifier.	L3	2	16
		Or			
	b	Explain the principle and operation of a Schmitt Trigger circuit with transfer characteristics.	L3	2	16
13.	a	Describe the operation of a variable transconductance multiplier circuit. Also derive the expression for its output voltage.	L3	3	16
		Or			
	b	Illustrate the operation of VCO with neat block diagram. Also derive an expression for free running frequency.	L3	3	16

14.	a	i	Discuss the operation of weighted resistor type DAC with relevant circuit diagram and waveforms.	L4	4	8
		ii	Write short notes on R-2R Ladder type DACs.	L4	4	8
			Or			
	b		Construct the functional diagram of the dual slope ADC and explain with its integrated output waveform. Also compare dual slope ADC with successive approximation ADC.	L4	4	16
15.	a		Draw the functional block diagram of ICL 8038 function generator IC and explain its operation.	L2	5	16
			Or			
	b		Describe the internal functional block diagram of IC 723 Voltage Regulator. Also explain how positive voltage is provided by IC 723 with appropriate circuit.	L2	5	16