

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/ B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

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)

<i>Q.No.</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
1.	List the characteristics of ideal op-amp.	RE	1	2
2.	Why IC 741 is not used for high frequency applications?	UN	1	2
3.	Write the significance of voltage follower.	RE	2	2
4.	Mention the limitation of the basic differential amplifier	RE	2	2
5.	What is Gilbert multiplier cell?	UN	3	2
6.	Define capture range and lock range of PLL.	UN	3	2
7.	Write the merits and demerits of binary weighted DAC	RE	4	2
8.	Calculate the values of LSB and MSB for an 8-bit DAC for 0V to 10V range.	UN	4	2
9.	What is the need for voltage regulator ICs?	UN	5	2
10.	State the applications of Multivibrators.	UN	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)

<i>Q.No.</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a Draw the circuit of Widlar current source and derive an expression for its output current?	UN	1	13
	Or			
	b Explain the DC characteristics of an operational amplifier with neat diagram.	UN	1	13
12.	a Derive an expression for output voltage of differentiator and integrator using operational amplifier.	AP	2	13
	Or			
	b Design a second order low pass butter worth filter for a cut off frequency of 1KHz.	AP	2	13
13.	a Explain the operation of a variable transconductance multiplier circuit. Derive the expression for its output voltage.	AP	3	13
	Or			
	b Illustrate the operation of VCO with neat block diagram. Also derive an expression for f_0 .	AP	3	13

14.	a	i	Explain the working of R-2R ladder DAC with a Circuit schematic.	UN	4	7
		ii	A 10-bit DAC has a step size of 10 mV. Determine the full-scale output voltage and the percentage resolution.	UN	4	6
			Or			
	b		Explain the working of Dual Slope ADC and Successive Approximation ADC with block diagram.	UN	4	13
15.	a		Explain the working of 555 timer as Monostable Multivibrator and derive an expression for the frequency of oscillation.	UN	5	13
			Or			
	b		Discuss the role of IC723 as low voltage and high voltage regulator with appropriate circuits and expressions.	UN	5	13

*PART – C (Marks 1*15 = 15)*

<i>Q.No</i>		<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
16.	a	Design an instrumentation amplifier and derive the gain for that circuit.	AP	2	15
		Or			
	b	Show that the ON and OFF time of astable multi-vibrator using 555 timer IC is $T_{High}=0.69(R_A+R_B)C$, $T_{Low}=0.69R_B C$. Also evaluate the free running frequency and duty cycle, if $R_A=6.8\text{ K}\Omega$, $R_B=3.3\text{ K}\Omega$ and $C=0.1\text{ }\mu\text{f}$.	AP	5	15