Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 60022

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JAN. 2025
Fourth Semester
Information Technology
U19IT407 – LINEAR INTEGRATED CIRCUITS
(Regulation2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Mention the importance of current mirrors.	2	K2	CO1
2.	What is active load? Where is it used?	2	K2	CO1
3.	List the features of Instrumentation amplifier.	2	K2	CO2
4.	Sketch the circuit of op amp voltage follower.	2	K1	CO2
5.	Define Trans-conductance amplifier.	2	K1	CO3
6.	What is the purpose of using a low pass filter in PLL?	2	K2	CO3
7.	Write down the drawbacks of weighted resistor D/A converter.	2	K1	CO4
8.	The basic step of a 9bit DAC is 10.3mV. If 000000000 represents 0Volts, what is the output for an input of 101101111?	2	K2	CO4
9.	List the applications of 555 timer in Monostable mode.	2	K1	CO5
10.	What do you mean by monolithic switching regulator?	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	With neat sketch explain in detail the working of Widlar and Wilson current sources.	13	K2	CO1
		(OR)			
	b)	Explain the internal circuit diagram of IC 741 and discuss its AC and DC performance Characteristics.	13	K2	CO1
12.	a)	Draw the circuit diagram of an instrumentation amplifier and derive the expression for gain.	13	K2	CO2
		(OR)			
	b)	With the neat block diagram explain logarithmic amplifier and Antilogarithmic Amplifier.	13	K2	CO2
13.	a)	Describe the functions of analog multiplier using emitter coupled transistor pair and discuss the Gilbert multiplier cell in detail.	13	K2	CO3
		(OR)			
	b)	Discuss any three applications of PLL with neat diagrams.	13	K2	CO3
14.	a)	Discuss the working of voltage and current mode R-2R Ladder type D/A converter with suitable expressions.	13	K2	CO4
		(OR)			
	b)	With suitable example discuss the working of successive approximation type analog to digital converter.	13	K2	CO4
15.	a)	With neat functional diagram, explain the working of IC555 timer as Astable Multivibrator and derive an expression for the frequency of oscillation with relevant waveforms.	13	K2	CO5
		(OR)			
	b)	Discuss the operation of IC 723 general purpose regulator with appropriate diagrams.	13	K2	CO5

PART – C

(1 x 15 = 15Marks)

Q.No.			Questions	Marks	KL	CO
16.	a)	i.	Explain with neat diagrams the operation of an Op-amp differentiator.	8	K3	CO2
		ii.	Design an Op-amp differentiator to differentiate an input signal with maximum frequency of f_{max} =100Hz	7	K3	K3

(OR)

b)	Calculate the free running frequency, lock range and capture range of PLL whose ext. timing resistor Rr=15 kΩ, ext. timing capacitor Ct=0.01μF, Filter Capacitor C_2=1μF and supply voltage ± 6 V. Sketch the block diagrams of PLL using the above component values.	15	K3	CO4