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: 70047

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JAN. 2025
Fourth Semester
Electronics and Communication Engineering
U19EC413 / U19EC420 – LINEAR INTEGRATED CIRCUITS
(Common to BME)
(Regulation 2019)

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.	Define OP-AMP. Draw the pin configuration of IC741.	2	K1	CO1
2.	Compare the characteristics of ideal and practical operational amplifier.	2	K1	CO1
3.	Draw the voltage follower using op-amp and show that its gain is equal to unity.	2	K1	CO2
4.	How precision rectifiers differ from conventional rectifiers?	2	K1	CO2
5.	List few applications of voltage controlled oscillator.	2	K1	CO3
6.	How frequency multiplication can be achieved by PLL?	2	K1	CO3
7.	Find output voltage produced by a 4bit DAC whose output range is (0 – 10)V given with input binary number 0101?	2	K3	CO4
8.	Which is the fastest ADC? Give reason.	2	K1	CO4
9.	Define line regulation & load regulation of a regulator.	2	K1	CO5
10.	What is the purpose of having input & output capacitors in the IC voltage regulators?	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	With neat diagram explain the operation of inverting & non-inverting amplifier in closed loop configuration. Derive the expression for closed loop voltage gain of both.	13	K2	CO1
		(OR)			
	b)	Draw the internal circuit diagram of IC741. Explain AC and DC characteristics of IC741.	13	K2	CO1
12.	a)	Derive the expression for output voltage for differentiator & Integrator. Sketch the frequency response characteristics.	13	K2	CO2
		(OR)			
	b)	Design a 1storder LPF for the following specification Pass band voltage gain is 2 and cut off frequency, (f_C) is 10KHz.	13	K3	CO2
13.	a)	Explain the working principle of voltage controlled oscillator. Also derive an expression for voltage to frequency conversion factor.	13	K2	CO3
		(OR)			
	b)	Illustrate the operation of analog multiplier using emitter coupled transistor pair.	13	K2	CO3
14.	a)	i. Classify ADCs based on the conversion techniques.	4	K2	CO4
		ii. With circuit schematic, explain successive approximation type A to D converter.	9	K2	CO4
		(OR)			
	b)	Explain the working R-2R ladder DAC, by taking example of a three bit DAC circuit. Sketch the corresponding equivalent circuits and hence obtain the equation for output.	13	K2	CO4
15.	a)	i. Discuss the 723 IC general purpose voltage regulators in detail.	8	K2	CO5
		ii. Write short notes on Optocouplers.	5	K2	CO5
		(OR)			
	b)	Draw and explain the working of IC555 timer. How can be it connected for the monostable mode?	13	K2	CO5

PART – C

(1 x 15 = 15Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	Briefly explain the inverting summing amplifier. Draw the adder circuit for the expression Vo = -(0.1V1+V2+V3), where V1, V2, V3 are the inputs.	15	K2	CO2
		(OR)			
	b)	i. Name the circuit that is used to detect the peak value of the non-sinusoidal waveform. Explain the operation.	8	K2	CO2
		ii. Write short notes on logarithmic & antilogarithmic amplifiers.	7		