U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2024 Supplementary Examinations

Programme: B.E. **Semester: IV**
Branch: ES Cluster-EE, ECE **Duration: 3 hrs.**
Course Code: 19ES4CCLIC **Max Marks: 100**
Course: Linear Integrated Circuits

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	Draw the equivalent circuit of op-amp. List ideal characteristics of op-amp.	CO1	PO1	**04**
	b)	Design a full wave precision rectifier circuit to get a positive pulsating DC output and explain its working. Draw the necessary waveforms.	CO1	PO2	**08**
	c)	For an inverting op-amp amplifier circuit R1 = 10 kΩ , R2 = 100 kΩ, Vi = 1v, R_1 = 25 kΩ Find (i) i_1 (ii) v_0 (iii) i_L (iv) Total current I_o into the output pin.	CO1	PO1	**08**
		OR			
2	a)	Explain working of instrumentation amplifier, obtain an expression for output voltage	CO1	PO1	**08**
	b)	Explain the working of 'voltage to current' converter with grounded load.	CO1	PO1	**06**
	c)	With a neat circuit diagram and waveforms, explain the working of peak detector circuit.	CO1	PO1	**06**
		UNIT - II			
3	a)	With a neat circuit diagram, explain the working of Wein bridge oscillator.	CO2	PO1	**06**
	b)	Design an astable multivibrator using op-amp to generate a square wave of frequency 1 Khz and DC supply voltage of ± 12V. Write the output waveforms.	CO2	PO2	**08**
	c)	Design a RC phase shift oscillator for a frequency of 1 KHz , assume C = 0.01 μF	CO2	PO2	**06**
		UNIT - III			
4	a)	Explain the operation of a series voltage regulator, and any two of its Important performance parameters.	CO3	PO1	**08**
	b)	Design a II order Butterworth LPF for a cut-off frequency of 2KHz	CO3	PO2	**06**

		c)	Discuss the technique of realizing higher order filters using lower-order filters.	*CO3*	*PO1*	**06**
			UNIT - IV			
	5	a)	Define following specifications of D to A converter with suitable illustrations (i) Resolution (ii) Monotonicity (iii) Differential nonlinearity	*CO4*	*PO1*	**06**
		b)	A 8 bits D to A converter has a resolution of 10 mv/bit. Find the analog output voltage for inputs i) 10001010 ii) 01100011	*CO4*	*PO2*	**04**
		c)	Explain a 4 bits R-2R DAC, derive an expression for the output voltage in terms of binary inputs.	*CO4*	*PO1*	**10**
			OR			
	6	a)	Implement a 2-bit fiash type of A to D converter and explain its operation.	*CO4*	*PO2*	**06**
		b)	Differentiate between open-loop and closed-loop type ADCs with an example for each type.	*CO4*	*PO1*	**04**
		c)	Explain the operation of Successive approximation ADCs, with relevant illustrations.	*CO4*	*PO1*	**10**
			UNIT - V			
	7	a)	With neat functional block diagram explain operation of 555 timer. Explain all the pin functions	*CO5*	*PO1*	**08**
		b)	Design a Monostable multivibrator using op-amp to obtain a pulse of width 10ms. Explain the operation	*CO5*	*PO1*	**08**
		c)	Briefly explain the application of PLL as a frequency multiplier.	*CO5*	*PO1*	**04**

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