U.S.N.										

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

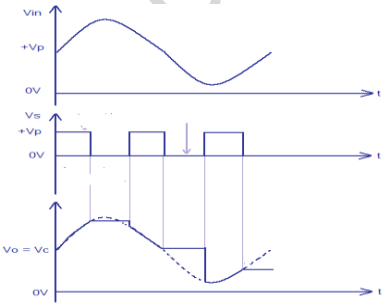
Autonomous Institute Affiliated to VTU

February 2025 Semester End Main Examinations

Programme: B.E. **Semester: IV**
Branch: ES Cluster (EIE/MD) **Duration: 3 hrs.**
Course Code: 23ES4PCLIC / 22ES4PCLIC **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.

		MODULE - I	CO	PO	Marks
1	a)	Discuss the DC characteristics of op amp with typical values	CO1	PO1	**08**
	b)	Discuss the working of a circuit using op amp to obtain the positive pulsating DC output.	CO1	PO1	**06**
	c)	A square wave of peak to peak amplitude of 500mv has to be amplified to peak to peak amplitude of 3volts with rise time of 5µs or less. Can a 741 be used?	CO2	PO2	**06**
		OR			
2	a)	Discuss Frequency response of an Op amp	CO2	PO2	**07**
	b)	Explain the working of an I-V converter with a neat circuit diagram.	CO1	PO1	**06**
	c)	Analyze the waveforms and suggest a circuit to obtain the output shown  Output	CO2	PO2	**07**
		MODULE - II			
3	a)	Derive an equation for obtaining amplitude and frequency of the Astable multivibrator using analog integrated device.	CO2	PO2	**10**
	b)	Obtain an equation for frequency of oscillation and gain for sustained oscillations for RC phase shift oscillator	CO2	PO2	**10**
		OR			

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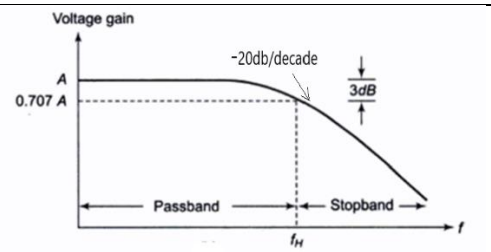
	4	a)	Discuss with neat circuit, Equations and waveforms the working of Schmitt trigger	*CO2*	*PO1*	**09**
		b)	Design and draw the circuit of a Wein bridge oscillator for generating a frequency of 2KHz, assume C = 0.05μF.	*CO3*	*PO2*	**06**
		c)	With a neat circuit diagram, explain the working of a zero-crossing detector	*CO1*		**05**
			MODULE - III			
	5	a)	Derive the transfer function of a variable gain High pass filter with relevant circuit and equation.	*CO3*	*PO3*	**10**
		b)	Design a fourth order Butterworth low pass filter having upper cut off frequency of 1KHz, $\alpha_1 = 0.765$ and $\alpha_2 = 1.848$.	*CO3*	*PO3*	**10**
			OR			
	6	a)	 Analyze the waveform shown, sketch a circuit using an op amp to obtain the output shown, also derive an equation for its transfer function.	*CO2*	*PO1*	**10**
		b)	Design a first order High pass filter having an upper cut off frequency of 2KHz with a pass band gain of 2. Also plot its frequency response.	*CO3*	*PO2*	**10**
			MODULE - IV			
	7	a)	Sketch the basic schematic of DAC. Also discuss the following specifications of DAC, (i) monotonicity and (ii) settling time	*CO4*	*PO1*	**07**
		b)	Explain the working of a Counter type ADC	*CO4*	*PO1*	**08**
		c)	A 12-bit DAC has a step size of 8mV.Determine the full-scale output voltage and percentage resolution. Also find the output voltage for an input voltage of 100110011101.	*CO4*	*PO2*	**05**
			OR			
	8	a)	Sketch the basic schematic of ADC. Also discuss the following specifications of ADC, (i) Resolution and (ii) conversion time	*CO4*	*PO1*	**07**
		b)	Sketch the circuit and discuss the working principle for the weighted resistor DAC	*CO4*	*PO1*	**08**
		c)	The resolution of a 4-bit counting ADC is 0.6 volts. For an analog input of 5.5volts, what will be the output of the ADC?	*CO4*	*PO2*	**05**
			MODULE - V			
	9	a)	Sketch the basic block of PLL. Also discuss the following specifications of PLL, (i) Lock in range and (ii) pull in time.	*CO1*	*PO1*	**10**

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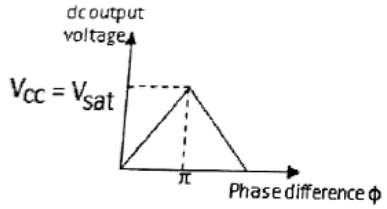
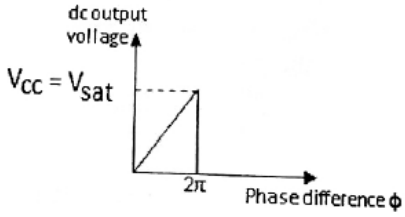
		b)	Suggest circuit using PLL for (i) Frequency translation (ii)Frequency division	*CO1*	*PO1*	**10**
			OR			
	10	a)	Identify and explain the suitable blocks of PLL which has following transfer characteristics as shown below.  	*CO2*	*PO1*	**10**
		b)	Describe the working principle of Voltage Controlled Oscillator with neat block diagram	*CO1*		**10**

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