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

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E.   **Semester: IV**
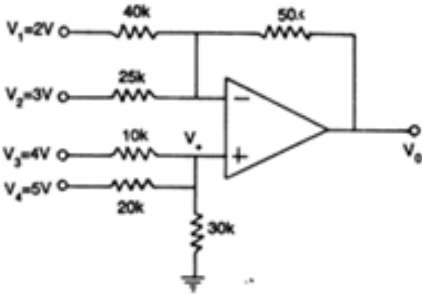**Branch: ES Cluster (EEE/ET/ECE/EIE/MD)**   **Duration: 3 hrs.**
Course Code: 19ES4CCLIC   **Max Marks: 100**
Course: Linear Integrated Circuits
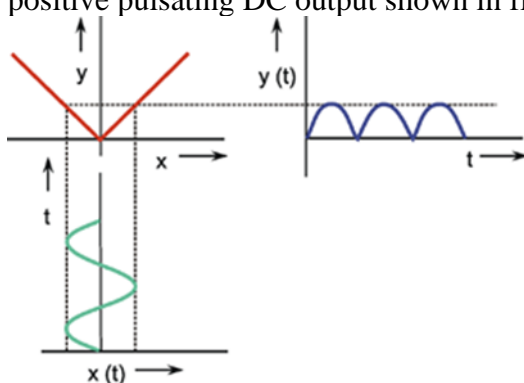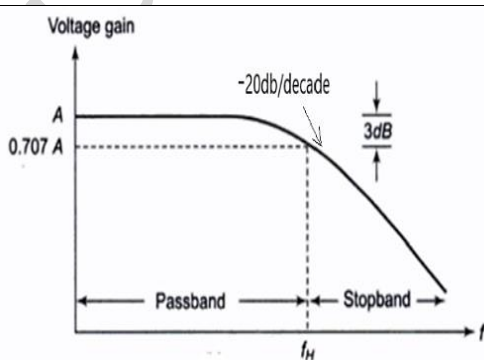
Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

				CO	PO	Marks
			UNIT - I	*CO*	*PO*	**Marks**
1	a)		The specifications of electronic systems using op amp 741 are given in terms of the steady-state characteristics. Discuss the DC characteristics to be considered with typical values	*CO1*	*PO1*	**08**
	b)		Explain the circuit of a voltage to current converter for grounded load and floating load	*CO1*	*PO1*	**06**
	c)		Find Vo for the adder subtractor shown in fig 1c fig 1c	*CO2*	*PO1*	**06**
			OR			
2	a)		Discuss Frequency compensation for an op amp	*CO1*	*PO1*	**06**
	b)		The 741C is used as an inverting amplifier with a gain of 50. The sinusoidal input has a variable frequency and maximum amplitude of 20mv peak. What is the maximum the frequency of input at which output will be undistorted? Assume that the amplitude is initially nulled.	*CO2*	*PO1*	**06**

		c)	Analyze the waveforms and suggest a circuit to obtain the positive pulsating DC output shown in fig 2c. fig 2c	CO3	PO2	**08**
			UNIT - II			
3	a)		Discuss with neat circuit ,equations and waveforms the working of Schmitt trigger	CO1	PO2	**10**
	b)		Obtain an equation for frequency of oscillation and gain for sustained oscillations for Wein bridge oscillator	CO2	PO2	**10**
			OR			
4	a)		Derive an equation for obtaining amplitude and frequency of the Astable multivibrator using analog integrated device.	CO2	PO1	**09**
	b)		Design a Schmitt trigger to obtain UTP= 6v and LTP=3v, Op amp used is 741, $V_{sat} = \pm14$v, assume $R_2 = 1k\Omega$	CO3	PO2	**06**
	c)		With a neat circuit,explain the working of an inverting comparator	CO1		**05**
			UNIT - III			
5	a)		Explain the working of an op amp series regulator. List the characteristic of three terminal linear regulators	CO 1	-	**10**
	b)		Design a first order unity low pass filter at a cut off frequency of 2kHz with a pass band gain of 2. Assume C= 0.1μF.	CO3	PO2	**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**

			UNIT - IV			
	7	a)	Sketch the basic schematic of DAC. Also discuss the following specifications of DAC, (i) monotonicity (ii) settling time	*CO2*	*PO1*	**07**
		b)	Explain the working of a Successive approximation ADC	*CO2*	*PO1*	**08**
		c)	What output voltage would be produced by a D/ A converter whose output voltage range is 0V to 10V and whose binary number is (i) 01 (for a 2- bit DAC) (ii)1011 (for a 4- bit DAC) (iii) 11111001 (for an 8- bit DAC)	*CO2*	*PO1*	**05**
			OR			
	8	a)	Sketch the basic schematic of ADC. Also discuss the following specifications of ADC, (i) Resolution and (ii) conversion time	*CO2*	*PO1*	**07**
		b)	Sketch the circuit and discuss the working principle for the R-2R digital to analog converter.	*CO2*	*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?	*CO2*	*PO1*	**05**
			UNIT - 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 .	*CO2*	*PO1*	**10**
		b)	Explain the working of 555 timer as an astable mutlivibrator with a neat circuit diagram.	*CO2*	*PO1*	**10**
			OR			
	10	a)	Explain the working of 555 timer as a Monostable mutlivibrator with a neat circuit diagram.	*CO2*	*PO1*	**10**
		b)	Describe the applications of PLL with neat block diagrams	*CO1*		**10**

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