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

Autonomous Institute Affiliated to VTU

August 2024 Semester End Main Examinations

Programme: B.E.   **Semester: IV**
Branch: Cluster (EIE/MD)   **Duration: 3 hrs.**
Course Code: 23ES4PCLIC   **Max Marks: 100**
Course: Linear Integrated Circuits
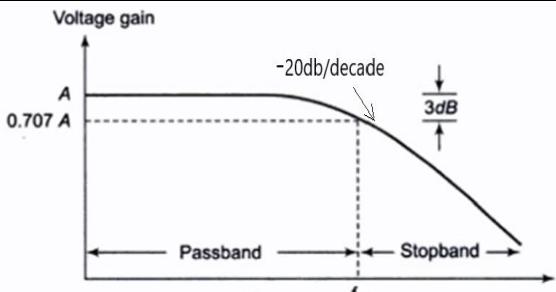
Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
               2. Missing data, if any, may be suitably assumed.

			MODULE - I	*CO*	*PO*	**Marks**
1	a)		With neat diagram, explain the blocks of an operational amplifie**r.**	*CO1*	*PO1*	**05**
	b)		Discuss the DC Characteristic of an Op amp. List its typical values.	*CO1*	*PO1*	**08**
	c)		Suggest a three-op amp-based amplifier that can pick up the electric potential which is small in amplitude in presence of large noise from different sources. Also derive equation for gain of the amplifier.	*CO1*	*PO1*	**07**
			OR			
2	a)		Discuss the frequency response of an Op amp.	*CO1*	*PO1*	**07**
	b)		What is the highest frequency of a triangular wave of 20V peak to peak amplitude that can be reproduced by an Op amp whose slew rate is 10V/µs? For a sine wave of same frequency, what is the maximum amplitude of output signal that remains undistorted?	*CO2*	*PO2*	**06**
	c)		Explain the working of series voltage regulator using Op amp with neat circuit diagram.	*CO1*	*PO1*	**07**
			MODULE - II			
3	a)		Derive an equations for amplitude and frequency of a triangular waveform for a triangular waveform generator.	*CO2*	*PO2*	**07**
	b)		Explain the working of 555 timer as a Monostable multivibrator with neat circuit diagram and waveforms.	*CO1*	*PO1*	**08**
	c)		Design and draw the circuit of a RC Phase shift oscillator for generating a frequency of 300Hz, assume C = 0.1µF.	*CO3*	*PO3*	**05**

			MODULE - III			
4	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	PO2	**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	PO3	**10**
			MODULE - IV			
5	a)		Sketch the basic schematic of DAC. Also discuss the following specifications of DAC, (i) monotonicity and (ii) settling time.	CO4	PO1	**07**
	b)		Discuss the working of Successive approximation ADC with neat circuit diagram.	CO4	PO1	**08**
	c)		Find out the step size and analog output of a 4 bit R-2R ladder DAC when input is1011 and 1001, assume V ref is 5V.	CO4	PO2	**05**
			OR			
6	a)		Sketch the basic schematic of ADC. Also discuss the following specifications of ADC, (i) Resolution and (ii) conversion time	CO4	PO1	**10**
	b)		Discuss the working of a weighted resistor DAC with neat circuit diagram.	CO4	PO1	**10**
			MODULE - V			
7	a)		Discuss the working of a phase locked loop with neat diagram. Also define (i)capture range (ii) Pull in time.	CO1	PO1	**12**
	b)		Suggest and explain circuit using PLL for the following (i) Frequency translation (ii) AM detector	CO1	PO1	**08**

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