

CRM08	Rev 1.10	EC	02/08/21
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CONTINUOUS INTERNAL EVALUATION- 3

Dept:EC	Sem / Div:IV A	Sub:Analog Circuits	S Code:18EC42
Date:04/08/2021	Time: 3:00-4:30 pm	Max Marks: 50	Elective:N
Note: Answer any 2 full questions, choosing one full question from each part.			

Q N	Questions	Marks	RBT	COs
PART A				
1	a Explain the working of a second order high pass Butterworth filter with a neat circuit diagram and frequency response. Write the relevant design equations.	9	L2	CO4
	b For an inverting Schmitt Trigger circuit $R_1 = 15K\Omega$; $R_2 = 1K\Omega$ and $V_{in} = 10V_{p-pp}$ sine wave. The saturation voltages are $\pm 14V$ and $V_{ref} = 2 V$. i) Determine the threshold voltages V_{ut} and V_{lt} . ii) Find the value of Hysteresis voltage V_{hy} .	6	L2	CO4
	c Derive the expression for closed loop voltage gain, input and output resistance of inverting Amplifier. The opamp 741C is connected as an inverting amplifier with $R_1=1k\Omega$ and $R_F=4.7k\Omega$. Compute the closed loop parameters: A_F , R_{IF} , R_{OF} , f_F . Given $A=400000$, $R_i=33M\Omega$ and $R_O=60\Omega$; supply voltages are $\pm 13V$; Max output voltage swing = $\pm 13V$, Unity gain bandwidth = $0.6MHz$.	10	L3	CO4
OR				
2	a What is an instrumentation amplifier? What are its applications? With a neat circuit diagram explain an instrumentation amplifier using a transducer bridge.	10	L2	CO4
	b Explain the operation of 4-bit R-2R DAC with neat circuit. For the R-2R DAC, with $R=10k\Omega$ and $R_F=20k\Omega$ and $V_{REF}=5V$, determine the output voltage when the inputs $b_0=b_1=5V$ and $b_2=b_3=0V$	9	L3	CO4
	c Explain the working of a Successive Approximation type of ADC.	6	L2	CO4
PART B				
3	a Derive an Expression for the output of a inverting Summing amplifier with three inputs and averaging amplifier	10	L2	CO4
	b Explain the operation of a monostable multivibrator with relevant diagrams and waveforms.	10	L2	CO4
	c Draw the circuit and waveforms for an inverting Schmitt Trigger using opamp, with relevant expressions.	5	L2	CO4
OR				
4	a Explain the basic comparator circuit using an opamp. How can this circuit be used in an application as a zero crossing detector?	10	L2	CO4
	b Design an Astable Multivibrator using 555 timer having output frequency of $10KHz$ with a dutyCycle of 25% .	6	L3	CO4
	c Draw and Explain the circuit and frequency response of a wide band-pass filter.	9	L2	CO4