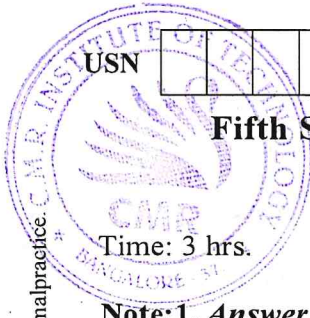


Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.



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10EE56

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020

Linear ICs and Applications

Time: 3 hrs.

Max. Marks:100

- Note:1. Answer any FIVE full questions, selecting atleast TWO questions from each part.**
2. Use of resistor and capacitor standard values list are permitted.

PART – A

- 1 a. With a neat diagram, explain the operation and design of a high input impedance capacitor coupled non inverting amplifier. Also find its input impedance. (08 Marks)
b. Sketch the circuit and explain the operation of a capacitor coupled inverting amplifier using single polarity supply. (06 Marks)
c. Design a capacitor coupled voltage follower circuit to have a lower cutoff frequency of 120Hz. The load resistance is 8.2kΩ and Op – amp used has a maximum input bias current of 600 nA. (06 Marks)
- 2 a. What is Frequency Compensation? Explain the frequency compensation technique using phase lag network. (06 Marks)
b. List the precaution that should be taken for Operational amplifier circuit stability. (08 Marks)
c. Discuss the effects of stray capacitance on Op – amp circuit stability and write the equation to determine the value of stray capacitance that might produce circuit instability. (06 Marks)
- 3 a. With a neat circuit diagram, explain the operation and design of a precision full wave rectifier. (08 Marks)
b. A 3.3 kHz , ± 2V square wave with a 600Ω source resistance is to have its positive peak clamped at ground level. Using a bipolar Op – amp with supply of ± 12V, design a suitable precision clamping circuit. The tilt on the output is not to exceed 2%. (06 Marks)
c. With a neat diagram, explain the operation of successive approximation type Analog to digital converter. (06 Marks)
- 4 a. Draw an Op – amp non inverting Schmitt trigger circuit and explain its operation. (06 Marks)
b. Sketch the circuit of an Op – amp a stable multivibrator and explain its operation and show the waveforms. (06 Marks)
c. A capacitor coupled zero crossing detector is to handle a 1kHz square wave input with a peak to peak amplitude of 6V. Design a suitable circuit using a 741 Op – amp with a ± 12V supply. Assume $V_B = 0.1V$. (08 Marks)

PART – B

- 5 a. With a neat circuit diagram and waveforms, explain the operation of triangular / Rectangular wave generator which has frequency and duty cycle controls. (09 Marks)
b. With a neat diagram and waveforms, explain the operation of Op – amp phase shift oscillator. (06 Marks)
c. Using a BIFET Op – amp with a supply of ± 12V, design a Wein bridge oscillator to have an output frequency of 15 KHz. (05 Marks)

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- 6 a. Sketch the circuit of a second order low pass filter, explain its working and design steps. (08 Marks)
- b. Design a second order high pass active filter to have a cutoff frequency of 12KHz. Use a 715 Op – amp, I_{Bmax} for 715 Op – amp is $1.5 \mu A$. (06 Marks)
- c. With a neat circuit diagram, explain the operation of single stage first order bandpass filter. Show the frequency response. (06 Marks)
- 7 a. With a block diagram, explain FLT – U2 universal active filter. Also explain how it can be realized as second order low pass, high pass and band pass filter. (08 Marks)
- b. With a block diagram, explain the Operating principle of phase locked loop. (06 Marks)
- c. Explain the theory of operation of a switched capacitor filter. (06 Marks)
- 8 a. With a neat circuit diagram, explain the operation of a precision voltage regulator. (06 Marks)
- b. Explain the terms line regulation , load regulation and ripple rejection for a dc voltage regulator. (06 Marks)
- c. With a neat schematic, explain the salient features of a 723 IC regulator. Show how it can be connected to function as positive and negative voltage regulator and explain. (08 Marks)

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