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10EE56

Fifth Semester B.E. Degree Examination, June/July 2018

Linear ICs and Applications

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FIVE full questions, selecting at least TWO questions from each part.***
2. ***Use of 741 data sheet is permitted.***
3. ***Use standard resistor and capacitor chart is permitted.***

PART – A

1 a. Explain the operation of high input impedance capacitor coupled voltage follower. Develop the expression for input impedance Z_{in}. **(08 Marks)**

b. Discuss the need to set upper cut off frequency of an OPAMP. Show how upper cut off frequency can be set for an inverting amplifier. **(06 Marks)**

c. Design a capacitor coupled voltage follower using 741 OPAMP. The lower cut off frequency of circuit is to be 50 Hz. Take $R_L = 3.9\ K\Omega$. **(06 Marks)**

2 a. Discuss briefly phase-lag compensation for frequency compensation. **(08 Marks)**

b. Discuss the compensation for stray capacitance effect with necessary circuit. **(06 Marks)**

c. What are the precautions to be observed for OPAMP circuit stability? **(06 Marks)**

3 a. Mention advantage of precision rectifier over ordinary diode rectifier. Sketch circuit of precision full wave rectifier using half wave rectifier and summer. Explain the working of the circuit. **(08 Marks)**

b. Explain the operation of voltage follower peak detector with necessary circuit diagram. **(06 Marks)**

c. With a neat circuit explain operation of a 2-bit flash ADC. **(06 Marks)**

4 a. A capacitor coupled zero crossing detector is to handle 1 kHz square wave input with peak-to-peak amplitude of 6V. Design a suitable circuit using OPAMP 741 with ±12V supply. Also estimate minimum slew rate of circuit. **(08 Marks)**

b. Sketch the circuit of OPAMP astable multivibrator. Explain its operation with relevant waveforms. **(06 Marks)**

c. Discuss how trigger points can be adjusted to realize a different UTP and LTP for a inverting Schmitt trigger circuit. **(06 Marks)**

PART – B

5 a. Explain with necessary circuit operation of triangular/rectangular waveform generator. Draw waveforms at various output points. **(08 Marks)**

b. Explain with necessary circuit how diodes may be used for output amplitude stabilization with Wein bridge oscillator. **(06 Marks)**

c. Design phase shift oscillator to have a frequency of 3.5 kHz. Use OPAMP 741 with ±12V supply. **(06 Marks)**

6 a. Sketch circuit of a single stage band pass filter. Explain the lowpass and highpass operation of circuit. **(08 Marks)**

b. Design a 2nd order lowpass filter for a cutoff frequency of 2 kHz using OPAMP 741. **(06 Marks)**

c. Explain how band stop filter can be realized using lowpass filter, highpass filter and summer. **(06 Marks)**

7 a. Explain the theory of operation of switched capacitor filters. **(06 Marks)**

b. Explain with block diagram the operation of PLL. **(08 Marks)**

c. Draw circuit representation of LM380 power amplifier and discuss its features. **(06 Marks)**

8 a. Discuss about the various parameters used to measure regulator performance. **(06 Marks)**

b. Explain the operation of adjustable output regulator with necessary circuit. **(08 Marks)**

c. Sketch regulator using LM340IC voltage regulator. Briefly discuss LM340 and its performance. **(06 Marks)**

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