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Fourth Semester B.E. Degree Examination, June/July 2013
Linear IC and Applications

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer FIVE full questions, selecting at least TWO questions from each part.
2. Assume suitable values/data.

PART – A

- 1 a. Define the following terms with respect to operational amplifier:
 - i) CMRR
 - ii) PSRR
 - iii) Slew rate
 - iv) O/P impedance. (08 Marks)
- b. With a neat circuit diagram, explain basic operational amplifier circuit. (06 Marks)
- c. An opamp has $R_1 = R_2 = 22K\Omega$ with a resistor tolerance of $\pm 20\%$. Determine input offset voltage due to i) the 741 specified i/p offset voltage; ii) 741 i/p offset current; iii) the resistor tolerance. (06 Marks)
- 2 a. Explain capacitor coupled non inverting amplifier with circuit diagram. (06 Marks)
- b. Design an noninverting amplifier to be capacitor coupled at input and output. The load resistor is 2.2.K, lower cutoff frequency 120Hz. Make necessary modifications to give highest i/p impedance and determine capacitor values for $V_i = 15mV$, $A_v = 66$. (10 Marks)
- c. Briefly explain how will you set the upper cutoff frequency in inverting amplifier. (04 Marks)
- 3 a. Explain opamp circuit stability with feed back in inverting amplifier. (08 Marks)
- b. Draw the circuit of head compensation network. Explain its operation and show how it affects the frequency response of an opam. (06 Marks)
- c. i) Calculate the slew rate cutoff frequency for voltage follower circuit using 741 opamp if the peak of sine wave o/p is to be 5V.
- ii) Also determine maximum peak value of the sinusoidal o/p voltage that will allow 741 voltage follower circuit to operate 800 kHz, unity gain cutoff frequency. (06 Marks)
- 4 a. Explain with neat circuit of differential i/p and differential output amplifier. (08 Marks)
- b. Explain neatly with circuit and W/F's at various points of high input impedance full-wave precision rectifier. (12 Marks)

PART – B

- 5 a. With neat circuit diagram and waveforms, explain precision clamping circuit. (10 Marks)
- b. Explain with neat circuit diagram and waveform of triangular/rectangular waveform generator with frequency and duty cycle control. (10 Marks)

- 6 a. Explain an inverting Schmitt trigger circuit with waveform. (07 Marks)
b. Draw the circuit of opamp astable multivibrator and explain its operation. (07 Marks)
c. Using opamp, design a first order low pass filter to have cutoff frequency 1kHz. (06 Marks)
- 7 a. Explain with neat circuit of regulated power supply with different parts. (06 Marks)
b. List and briefly explain the characteristics of three terminal IC regulators with standard representation of the same. (07 Marks)
c. What is principle of switched mode power supply? Discuss their advantages and disadvantages. (07 Marks)
- 8 a. Explain the functional diagram of IC555 timer with neat sketch. (10 Marks)
b. Explain clearly PLL with block diagram, also define: lock in range, capture range, full in time with respect to capture transient. (10 Marks)

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