Q.P. Code: 3387

(3 Hours)

[Total Marks: 100]

N.B.: (1) Question No. 1 is compulsory.
(2) Solve any Three out of remaining questions.
(3) Assume suitable data if required.

1. Solve the following: 20
   (a) Design a circuit to keep LED 'ON' for 30 seconds once circuit is triggered.
   (b) What is CMRR for op-amp and how to measure it practically?
   (c) Explain first order active filter circuit.
   (d) Design a 0.5A current source using IC7805. Assume RL = 10Ω.
   (e) Explain 7490 Decade counter.

2. (a) Design triangular waveform generator for frequency for 5 kHz and Vopp=6V using op-amp. 10
   (b) Explain IC 741 based RC phase shift oscillator with proper waveforms.
       Design RC phase shift oscillator to produce sinusoidal frequency output of 5 kHz.

3. (a) Design a high pass second order filter for the cut off frequency of 1 kHz and passband gain AF=2. 10
   (b) Write the advantages of precision rectifier. Explain half wave precision rectifier along with neat waveforms.

4. (a) Design a voltage regulator using IC 723 to give V0=5V and output current of 2A. 10
   (b) Draw instrumentation amplifier using opamp and hence derive equation for output voltage.
   (c) Explain zero crossing detector with neat diagram.

5. (a) Draw and explain the functional diagram of IC 555 and explain its operation in astable mode. 10
   (b) With the help of a neat circuit diagram explain the working of 74163 synchronous 4-bit binary counter.
       Also illustrate the cascading connections for 74163 based counters.

6. Write short note on the following: 20
   (a) 74181 Arithmetic Logic Unit.
   (b) Current foldback protection.
   (c) Any two applications of PLL 565.
   (d) Voltage to frequency converter.