T.E. Sem V (CBGS) (EXTC)

Q.P. Code : **3387**

IC 4/6/15

(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. 10

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. 10

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. 6
   (c) Explain zero crossing detector with neat diagram. 4

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. 10

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.