

Prelim Paper

Time: 3 Hrs.]

Linear Integrated Circuits

[Marks : 80

N.B.: (1) Question No. 1 is compulsory.

(2) Solve any three questions from the remaining.

(3) Assume suitable data if necessary.

(4) Figures to the right indicate full marks.

1. Solve any **FOUR** of the following : **20**
 - (a) Explain Resolution, Accuracy and settling time w.r.t. DAC.
 - (b) Compare Voltage regulators with IC78XX and IC723.
 - (c) Describe the basic block diagram of Phase Locked Loop (PLL).
 - (d) Define input Offset voltage, Output Offset voltage, Input bias current and input offset current for Op–amps.
 - (e) Compare zero Crossing Detector with Schmitt Trigger.

2. (a) Derive the Output Voltage (V_o) expression of Op–amp three input Averaging Circuit. **10**
(b) Give Complete Analysis of Inverting Amplifier Op–amp circuit. Hence design it for Voltage gain of 10. **10**

3. (a) Design Schmitt trigger to achieve $UTP = 2\text{ V}$ and $LTP = -2\text{ V}$ **10**
(b) Draw neat diagram of Instrumentation Amplifier using Op–amp and hence derive the equation of output voltage. **10**

4. (a) Explain the working of R/2R Ladder D/A converter **10**
(b) Design a 2nd order KRC filter (LPF) for cut off frequency of $f_o = 10\text{KHz}$ with quality factor Q of 5. **10**

5. (a) Explain Astable Multivibrator using Op–amp. **10**
(b) Design a positive Voltage regulator to generate $V_o = +5\text{ Volts}$ and $I_o = 50\text{ mA}$ by using IC LM723. Draw neat diagram of the designed circuit. **10**

6. Write short notes on : **20**
 - (a) Half wave Precision Rectifier
 - (b) Log–Antilog Amplifier
 - (c) Voltage controlled oscillator
 - (d) Monostable Multivibrator using IC555

