

Time: 3 hours

Total Marks: 80

N.B.:

- 1) Question No.1 is compulsory
- 2) Solve any three from remaining five.
- 3) Figures to right indicate full marks.

- Q1. Solve **any four** out of five
- a. Explain the open loop and closed loop characteristics of Op-Amp. 5
 - b. Explain 78XX series fixed voltage regulator 5
 - c. Explain FSK Demodulator using PLL 5
 - d. Define the following parameters for Operational Amplifier 741 5
 - i) Input offset voltage
 - ii) Slew Rate
 - e. Explain the Virtual ground concept of Operational Amplifier. 5
- Q2 a. Explain Astable Multivibrator using IC 555 with the help of functional block diagram. Design the same for 2ms time period and 70% duty cycle. 10
- b. Explain the working of Op-Amp as Schmitt Trigger. 10
- Q3 a. Design a circuit to get output as $V_o = 2V_1 + 3V_2$ and $V_1 - V_2$ using an op-amp. 10
- b. Draw and explain the RC-phase shift oscillator using Op-Amp. Derive the expression for the output frequency. 10
- Q4 a. Generate square waveform using the Op-Amp. 10
- b. Explain the operation of Op-amp as second order Butterworth filter
- Q5 a. Draw and explain the functional block diagram of IC 723. Design the same for 4V of regulated supply voltage. 10
- b. Design and explain Op-Amp as an integrator and explain the frequency response. 10
- Q6 **Write short notes on (any four)**
- a. Instrumentation Amplifier 5
 - b. Op-Amp as a peak detector 5
 - c. Explain 7805 voltage regulator 5
 - d. Op-Amp as Half wave rectifier 5
 - e. VCO IC 566 in brief 5
