

Duration: 03 Hrs.

Max. Marks 80

Instructions:

- (1) Question 1 is compulsory, solve any three from remaining questions
- (2) Assume suitable data if necessary.
- (3) Diagrams to be drawn neatly.

Question No.		Max. Marks
Q 1	Solve any FOUR from the following	
Q1(A)	Draw block diagram of OPAMP and explain function of each block..	05
Q1(B)	Draw the circuit diagram of opamp to provide output voltage $V_0 = (V_1 + V_2) / 2$, where V_1, V_2 are the input voltages and derive the expression of output voltage.	05
Q1(C)	Explain operation of Zero crossing detector.	05
Q1(D)	Calculate the values of LSB,MSB and full scale output for an 8 bit DAC for the 0-10V range.	05
Q1 (E)	Explain in detail LM 380 Power amplifier	05
Q2(A)	Draw the circuit diagram and explain the operation of Sample and hold circuit, state its application areas.	10
Q2(B)	Design first order Low pass filter using opamp at a cut off frequency of 1Khz , having pass band gain of 2.	10
Q3(A)	Draw the circuit diagram and explain the operation of precision half wave rectifier. Derive the expression of output voltage. Sketch its transfer characteristics.	10
Q3(B)	Design square wave generator using opamp to have output voltage = ± 5 volts, frequency 1khz,with 70%duty cycle. Assume $V_{CC} = \pm 14$ volts.	10

- Q4(A)** Draw neat circuit diagram and explain the operation of Dual slope type analog to digital converter. What are its advantages and disadvantages. **10**
- Q4(B)** Draw neat circuit diagram and explain the operation of Astable multivibrator using IC 555. List specifications of IC 555. **10**
- Q5(A)** Design a IC 555 based symmetrical square wave generator for 1.4 KHz frequency of $V_{cc} = 5\text{ V}$. Draw all waveforms. **10**
- Q5(B)** Design Noninverting amplifier using Op-Amp for voltage gain of 6.6, with complete analysis. Which type of feedback is used in this amplifier? **10**
- Q 6** Solve any **TWO** of the following.
- Q6(A)** Explain different types of protections provided in IC 723 voltage regulator. **10**
- Q6(B)** Draw block diagram and explain the operation of PLL, Explain any one application of PLL. **10**
- Q6(C)** Draw circuit diagram and explain the operation of RC Phase shift oscillator using OPAMP. State formula for frequency of oscillations. **10**