

[Time: 3:00 Hours]

[Marks:80]

Please check whether you have got the right question paper.

- N.B:
1. Question 1 is compulsory
 2. Attempt any three out of remaining five questions
 3. Assume suitable data if required
 4. Figures to the right indicate full marks

- Q.1 **Attempt any four :-** (20)
- A. An opamp operates as a unity gain buffer with 3VPP square wave input. If opamp is ideal with slew rate 0.5V/microseconds, find the maximum frequency of operation.
 - B. Draw the circuit diagram of opamp as an averaging amplifier and derive the expression of output voltage.
 - C. Draw the circuit diagram and explain the operation of zero crossing detector.
 - D. Explain specifications of DAC.
- Q.2 A. Draw the circuit diagram and explain the operation of V -I converter, State its application areas. (10)
B. Design first order low pass filter using opamp at a cut off frequency of 1Khz ,having pass band gain of 2. (10)
- Q.3 A. Draw the circuit diagram and explain the operation of precision full wave rectifier. Derive the expression of output voltage. (10)
B. Design square wave generator using opamp to have output voltage = ± 5 volts, frequency 1 khz, with 70% duty cycle? (10)
Assume $V_{CC} = \pm 12$ volts.
- Q.4 A. Draw neat circuit diagram and explain the operation of successive approximation type analog to digital converter. (10)
B. Draw neat circuit diagram and explain the operation of monostable multivibrator using IC 555. (10)
- Q.5 A. Design a IC 555 based symmetrical square wave generator for 1 KHz frequency of $V_{CC} = 5$ V. (10)
Draw waveforms for voltage across timing capacitor and output..
B. Design a 0.5 A current source using IC 7805, for $R_L = 10$ ohms.? (10)
- Q.6 Solve any Notes on any **TWO** of the following:
- A. Functional block diagram and working of IC 723. (10)
 - B. Schmitt trigger and its applications. (10)
 - C. RC phase shift oscillator using opamp (10)