QP Code: 14855

(3 Hours) [Total Marks: 80]

N.B.: (1) Question No. one is compulsory.
(2) Solve any three questions from remaining.
(3) Assume suitable data if necessary.
(4) Figures to the right indicate marks.

1. (a) Design Inverting op-amp circuit for voltage gain 10. What care should be taken to operate it linearly. 4
   (b) Design a differentiator to differentiate the input signal that varies in frequency from 10 Hz to 1 kHz. 4
   (c) Compare zero crossing detector with schmitt trigger circuit. 4
   (d) What are the specifications of DAC? 4
   (e) Design a circuit to keep LED 'ON' for 20 seconds once circuit is triggered. 4

2. (a) Define the following.
   (i) Slew rate 10
   (ii) CMRR 10
   (iii) Input offset voltage 10
   (iv) Output offset voltage 10
   (v) PSRR 10

2. (b) Draw neat diagram of Instrumentation Amplifier using op-amp and hence derive the equation of output voltage. 10

3. (a) Give complete procedure to design schmitt trigger circuit and hence design it for UTP = 0.5 V and LTP = -0.5 V. 10
   (b) Explain 4-bit successive approximation type ADC. 10

4. (a) (i) Give design procedure of first order HPF. 3
   (ii) Draw functional block diagram of IC 8038. 3
   (iii) What is the basic and performance parameter of sample and hold amplifier circuit? 4

4. (b) Design RC phase shift oscillator to produce a sinusoidal frequency output of 5 kHz. 10

5. (a) Design triangular waveform generator for frequency of 5 kHz and Vopp = 6 V using op-amp. 10
5. (b) Compare normal regulator with SMPS, explain any one circuit of SMPS. 10

6. (a) Design voltage regulator using IC 723 to give $V_o = 5V$ and output current = 2A 10
   (b) Explain in detail about frequency multiplier and application of PLL. 10

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