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
Q1(A)	Draw block diagram of OPAMP and explain function of each block..	05
Q1(B)	Draw the circuit diagram of opamp as two input adder and derive the expression of output voltage.	05
Q1(C)	Explain any one application of comparator	05
Q1(D)	Compare 78XX and IC 723 voltage regulator.	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 High pass fitter 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 $= \pm 5$ volts,frequency 1khz,with 75% duty cycle. Assume VCC $= \pm 14$volts.	10

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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 monostable multivibrator using IC 555.List specifications of IC555.   10

Q5(A) Design a IC 555 based symmetrical square wave generator for 1.4 KHz frequency of Vcc= 5 V.Draw all waveforms.   10

Q5(B)   Design inverting amplifier using Op-Amp for voltage gain of -6.8 with complete analysis. Which type of feedback is used in this amplifier?   10
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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 wein bridge oscillator using OPAMP.State formula for frequency of oscillations.   10

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