**(3 HOURS)**                                                    **Total Marks :  80**

1. Question no. 1 is compulsory.

2. Solve any three from remaining five questions.

. 3. Assume suitable additional data if necessary

Q1  (a)  Write short note on virtual ground                      (5 marks)

    (b)  Define the following                                    (5 marks)

         a)Input offset voltage b)CMRR c)PSRR d)Slew Rate

    (c)  Explain a non inverting comparator with diagram.        (5 marks)

    (d)  If the time constant of an integrator is 1ms and the input is a   (5 marks)
         square wave of frequency 1kHz,$V_{pp} = 2V$. Draw the output
         waveforms.Assume $V_0$=0V at t=0.

Q2  (a)  Design a second order KRC low pass filter with a cut off   (10 marks)
         frequency $f_o$ = 1kHz and pass band gain of 1.586.

    (b)  Design an RC phase shift oscillator to oscillate at 100Hz.  (10 marks)

Q3  (a)  Discuss (any one)                                       (10 marks)

         a) square wave generator  b) triangular wave generator

    (b)  Draw the circuit diagram for a peak detector and explain the   (10 marks)
         working.

Q4  (a)  Design an astable multivibrator using IC555 for a frequency   (10 marks)
         of 2kHz and a duty cycle of 70%.what modification you
         suggest to obtain 50% duty cycle.

    (b)  Discuss in detail R-2R ladder D/A converter.            (10 marks)

Q5  (a)  Explain function of each block of PLL.                  (10 marks)

    (b)  Discuss classification of IC voltage regulators.Explain the   (10 marks)
         functional block diagram of a three terminal fixed voltage
         regulator.

Q6 (a) Write short note on (any two)                    (20 marks)

   a) Instrumentation amplifier

   b) Logarithmic amplifiers.

   c) Precision rectifiers

   d) Schmitt trigger