National Institute of Technology, Delhi

Name of the Examination: B. Tech. / M. Tech. / Ph.D.

Branch	: ECE	Semester	: V
Title of the Course	: IC Applications	Course Code	: EC 271
Time: 3 Hours		Maximum Marks: 50	

Note : All parts of section A are compulsory and carrying of 01 mark each.

Attempt any 4 questions from Section B each carrying 5 marks.

Attempt any 2 questions from section C each carrying of 10 marks.

Section A   (1X10)

Q 1. (a) What is the need of frequency compensation in OPAMP?

(b) What parameters determine the hysterisis?

(c) Why open loop op amp configuration is not used in linear applications?

(d) How do you achieve offset null in general purpose IC?

(e) Define unity gain bandwidth and CMRR of OP AMP.

(f) What do you mean by bistable multivibrator?

(g) Explain the important application of voltage follower using op amp.

(h) What is advantage of using Schmitt trigger for generating square wave.

(i) In the saw tooth wave generator, how does potentiometer affect the frequency and amplitude of the wave ?

(j) What is thermal drift?

Section B   (4X5)

Q 2. The gain of certain amplifier as a function of frequency is $A (j\omega) = -16 \times 10^6 / j\omega$. A feedback path connected around it has $\beta(j \omega) = 10^3 / (20 \times 10^3 + j\omega)^2$. Will the system oscillate? If so, at what frequency ?

Q 3. Draw the circuit of an antilog amplifier with temperature compensating network and explain its operation.

Q 4. How the outputs of OP AMP based integrators and differentiators differ from their mathematically derived counterparts.

Q 5. Design a second order HPF for low cut off frequency 2 KHz and pass band gain of 2.

Q 6. Draw the pin and functional diagram of mono stable multivibrator using 555 timer and explain its operation.

Section C   (2X10)

Q 7. (a) Draw the circuit diagram of an integrator and explain the operation using mathematical operations.

(b) Design a wide band reject filter having and .

Q 8. (a) How can we get the negative resistance using OP AMP?

(b) Design a differentiator to differentiate an input signal that varies in frequency from 10 Hz to 1KHz. (ii) If a sine wave of 1V peak at 1000 Hz is applied to the differentiator of part (i), draw its output waveform.

Q 9. (a) Design a narrow band reject notch filter and also derive the expression for its cut off frequency.

(b) Draw and explain the operation of IC 555 as astable multivibrator.