Printed Pages : 2 TEC507

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 3000 Roll No.

B.Tech

(SEM V) ODD SEMESTER THEORY EXAMINATION 2009-10

ANALOG INTEGRATED ELECTRONICS

Time : 3 Hours] *[Total Marks : 100*

Note : *(1) Attempt **all** questions.*
*(2) All questions carry **equal** marks.*

1 Attempt any **two** parts of the following :

(a) The parameters for the differential amplifier are given as : $R_C = 1\ k\Omega$, $R_S = 1\ k\Omega$, $h_{fe} = 1\ k\Omega$ and $R_E = 2\ M\Omega$. Neglecting h_{oe}, calculate the difference mode gain and common mode gain. Hence calculate CMRR in dB. The amplifier is in dual input, balanced output configuration.

(b) What do you mean by differential amplifier ? Explain the operation of a basic differential amplifier. Give the four differential amplifier configuration.

(c) Explain the Miller effect compensation method used for internally compensated op-amp. Which are the two commonly used compensating networks ?

2 Attempt any **two** parts of the following :

(a) Design the instrumentation amplifier to have a variable differential gain in the range 5-200. Use a 50 $k\Omega$ potentiometer.

(b) Explain the working of practical differentiator. Also derive its frequency response.

(c) Draw and explain the commonly used three op-amp instrumentation amplifier circuit. Derive expression for its gain.

3 Attempt any **two** parts of the following :

(a) What is an all pass-filter? Explain its operation and application areas.

(b) Design a multiple feedback narrow band pass filter with f_c=1 kHz, Q = 3 and A = 10.

(c) Explain the operation of a 4-bit R-2R type DAC and derive the expression for the output voltage.

4 Attempt any **two** parts of the following :

(a) Using op-amp design triangular wave generator and square wave generator.

(b) State the frequency of oscillation and minimum gain of op-amp required in Wien bridge Oscillator.

(c) Draw and explain the working of op-amp based staircase and pulse generator circuit.

5 Attempt any **two** parts of the following :

(a) Explain working of PLL using appropriate block diagram and explain any one application of the same.

(b) What is a voltage controlled oscillator? Explain the working of voltage controlled oscillator.

(c) What do you mean by Antilog amplifier? How log amplifier can be turned around to provide antilog function? Explain.