



Printed Pages : 4

TEC-507

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

**PAPER ID : 3000**

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**B. Tech.****(SEM. V) EXAMINATION, 2008-09  
ANALOG INTEGRATED ELECTRONICS***Time : 3 Hours]**[Total Marks : 100**Note : Attempt all questions.***I Answer any four questions of the following : 5×4=20**

- Explain the need of compensating network in op-amp circuit.
- Explain the difference between the frequency response of internally compensated and uncompensated op-amps.
- Draw the high frequency model of an op-amp with double break frequency. Explain the principle of this circuit.
- Justify that for a stable circuit, the additional phase angle provided by op-amp must be less than  $180^\circ$  when its magnitude reaches unity.
- Discuss dominant-pole compensation of an op-amp.
- Explain the input bias current characteristics of op-amp in default.

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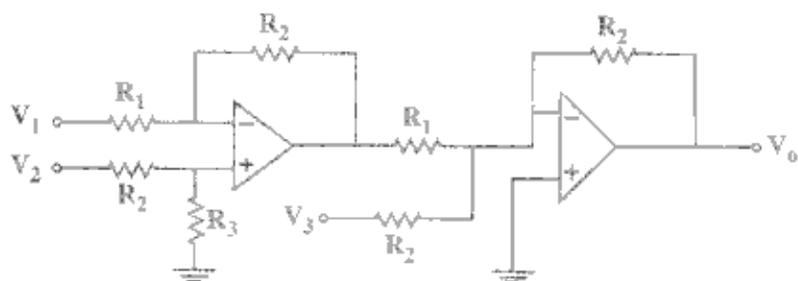


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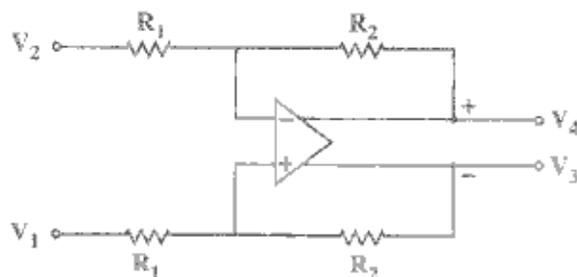
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2 Answer any **four** questions of the following :  $5 \times 4 = 20$

- (a) Explain between dc and ac amplifier.
- (b) Draw and explain the operation of a current to voltage converter. If 741 C is used. What is the lowest value of current that may be measured ?
- (c) Name and draw the system whose gain is controlled by an adjustable resistance. Explain its working
- (d) Calculate  $V_o$  for the circuit given below.



- (e) Show that  $V_o = \frac{R_2}{R_1}(V_1 - V_2)$  where  $V_o = V_4 - V_3$  for a differential amplifier with double ended output whose circuit is given below



- (f) Show that the output of an op-amp integrator to a step input of magnitude  $V$  volts is given

$$\text{by } v_0 = A_v V \left( 1 - e^{-t/R_1 C_f (1-A_v)} \right)$$

3 Answer any **two** question of the following : **10×2=20**

- (a) Draw the frequency response of an ideal low-pass, a high, pass a band pass, and a band reject filter.
- (b) Design a high pass filter at a cutoff frequency of 1 KHz with a pass band gain of 2. Plot the frequency response on semilog paper. Using the frequency scaling techniques, convert the 1 kHz cutoff frequency of the high pass filter to a cut off frequency of 0.6 kHz.
- (c) Design a fourth order butter worth Low Pass filter whose bandwidth is 1 kHz. Select all capacitors equal to 1000 nf.

4 Answer any **two** questions of the following : **10×2=20**

- (a) (i) Draw the circuit of a peak detector and explain its operation.
- (ii) Draw a sample and Hold circuit and explain its operation.
- (b) Draw a regenerative comparator system and explain its operation. What parameters determines the loop gain ? What parameters determine the hysteresis ?
- (c) Draw a circuit of triangle generator using a comparator and an integrator. Explain its operation by referring to the output waveform. What is the peak amplitude ?



5 Answer any **two** of the following : **10×2=10**

- (a) Explain the operation of the 555 timer as a monostable and astable multivibrator.
- (b) Explain the operating principles of a Phase Locked Loop (PLL).
- (c) Discuss different types of voltage regulators and explain the characteristics of each.

