Roll No. _____ Total Pages : 3

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BT-5/D07

LINEAR IC APPLICATIONS

PAPER - ECE-307E

Time : 3 Hrs. Maximum Marks : 100

Note : Attempt any five questions, selecting at least one from each unit.

UNIT-I

1. a. Define the common mode voltage. common mode voltage gain and common mode rejection ratio for Op-Amp. 5

   b. Draw and discuss the circuit of a Sample and Hold circuit. 5

   c. Explain the following parameters ; 10

   (i) Slew rate

   (ii) Input bias current

   (iii) Output offset voltage

   (iv) Supply voltage selection ratio

2. a. Sketch an Op-Amp non-inverting amplifier circuit. Also draw a basic Op-Amp circuit connected to function as a non-inverting amplifier. Explain the operation of the non-inverting amplifer and derive an equation for its voltage gain. 15

   b. What is Cascade amplifier ? List its characteristics. 5

UNIT-II

3. a What is the difference between compensated and non-compensated Op-Amp. ? Draw the circuit of lag and lead compensation networks. Discuss this operation and show how they affect the frequency response of an Op-Amp. 15

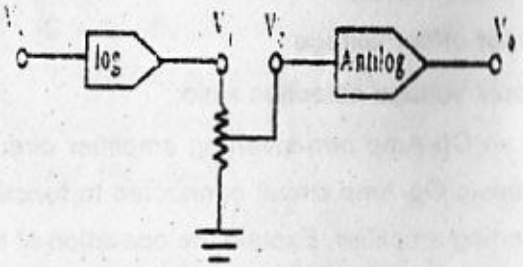
   b. Draw the frequency response of operational amplifer. Why its gain roll-off often certain frequency ? 5

4. a. Describe the circuit of voltage of current converter, if the load is (i) floating, and (ii) grounded. Is there any information on the side of the load when grounded ? 10

   b A non-inverting amplifier is to amplify 10mV signal to a lavel of 1 V using 741 Op-Amp. Design a suitable circuit and calculate its input and output impedances. 10

UNIT-III

5 a. Show that the following circuit can be used to raise the input V_S of an arbitrary power. Assume $V_1 = K_1 \ln K_2 V_S$, $V_0 = K_3 \ln^{-1} K_4 V_2$, $V_2 = \alpha V_1$. 15



   b. Name the circuit which can be used to detect the peak value of non-sinusoidal waveforms. Explain its operation 5

6. a. Sketch the circuit of a single stage band-pass filter. Discuss the low-pass and high-pass operation of the circuit. Show how band stop filter can be constructed by the use of band-pass filter and a summing circuit. 15

   b. Design a band-pass RC active filter with mid-band voltage gain of 30, centre frequency of 200 Hz, and Q = 5. Choose $C_1 = C_2 = 0.15\ \mu F$. 5

UNIT- IV

7 . a. Draw the block diagram of 555 timer IC. List its important features. 10

   b. What is the difference between digital and analog PLLs? 10

8. Write short notes on the following :

   i. 8038

   ii. PLL

   iii. Level translator circuit. 6, 7, 7