

Roll No. \_\_\_\_\_

Total Pages : 3

9525

BT-5/D08

LINEAR IC APPLICATIONS

PAPER - ECE-307E

Opt. (ii)

Time : 3 Hrs.

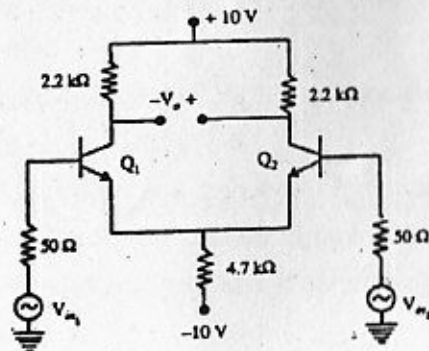
Maximum Marks : 100

Note : Attempt any five questions in all, selecting at least one question from each section.

### SECTION-A

1. a. Draw the level translator circuit. Why is it used with the cascaded differential amplifier ? Discuss the working of any one level translator circuit. 10
- b. For the dual input, balanced output differential amplifier shown in Fig.1,  $V_{BE} = 0.715 \text{ V}$ ,  $\beta_{dc} = \beta_{ac} = 100$ . Determine :
  - (i) Operating current & voltage values for each transistor.
  - (ii) Voltage gain.
  - (iii) Input resistance
  - (iv) Output resistance

10



(5th sem. Electronics)

46

2. a. Explain the term Virtual Ground. 3
- b. Draw and explain the block diagram representation of Op.-Amp. 7
- c. Define the following parameters :
  - (i) Input offset voltage
  - (ii) SVRR
  - (iii) CMRR
  - (iv) Output voltage swing
  - (v) Slew rate

10

### SECTION - B

3. a. Discuss why Open loop Op-Amp is unsuitable for linear applications ? 5
- b. Explain in detail Voltage series feedback and Voltage shunt feedback differential amplifiers. 10
- c. Draw the equivalent circuit of an Op-Amp. 5
4. a. Explain the frequency response of an Op-Amp. Explain the difference frequency response of internally compensated and non-compensated Op-Amps. 10
- b. What is Slew Rate ? List causes of slew rate and explain the effect of slew rate in various applications. 10

### SECTION- C

5. a. Explain major differences between dc and ac amplifiers. 8
- b. What are the advantages of active filters over passive filters ? Design a second order Butterworth high-pass filter with lower cut-off frequency of 2.5 kHz. 12
6. a. What is an Instrumentation amplifier ? Explain the working of a differential instrumentation amplifier using

(5th sem. Electronics)

47

- a. transducer bridge. 12
- b. With neat and clean waveforms, explain the operation of square wave generator. 8

**SECTION - D**

- 7. a. Discuss the working of 555 based Astable multi-vibrator. 10
- b. What is PLL ? Explain basic building blocks of PLL. List the various applications of PLL. 10
- 8. Write notes on the following :
  - a. Switched capacitor filter
  - b. IC 8038
  - c. Universal active filter
  - d. Oscillators

5 x 4 = 20