

**III B. Tech I Semester Supplementary Examinations, October/November - 2019**  
**LINEAR IC APPLICATIONS**

(Common to Electronics and Communication Engineering,  
 Electronics and Instrumentation Engineering)

Time: 3 hours

Max. Marks: 70

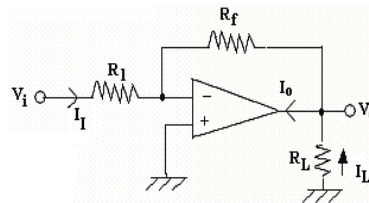
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answer **ALL** the question in **Part-A**  
 3. Answer any **THREE** Questions from **Part-B**

**PART -A (22 Marks)**

1. a) What is the significance of DC Coupling? [4M]
- b) Define Slew Rate and give its ideal and practical values. [4M]
- c) What are the applications of Comparators? [3M]
- d) What is the relationship between order of a filter and roll off rate? [4M]
- e) List the applications of VCO (566). [4M]
- f) What are advantages and disadvantages of dual slope ADC? [3M]

**PART -B (48 Marks)**

2. a) Explain the fundamentals of Differential amplifier. [8M]
- b) Draw the circuit diagram of differential amplifier with Single input and unbalanced output. Derive expressions for differential gain  $A_d$ , input resistance  $R_i$ , and output resistance  $R_o$ . [8M]
3. a) Explain the concept of Virtual Ground in detail. [8M]
- b) For the circuit shown below; calculate  $I_I$ ,  $I_L$  and  $V_O$  with  $R_I=9\text{ k}\Omega$ ,  $R_f=50\text{ k}\Omega$ ,  $V_i=0.5\text{ V}$ ,  $R_L=20\text{ k}\Omega$ . [8M]



4. a) Find  $R_I$  and  $R_f$  in the lossy integrator so that the peak gain is 20dB and gain is 3dB down from its peak when  $\omega=10,000\text{ rad/sec}$ . use a capacitance of  $0.01\text{ }\mu\text{F}$ . [8M]
- b) With a neat sketch explain the operation of Triangular generator. [8M]
5. a) Design a low pass filter with a cut off frequency of 1 kHz and with a pass band gain of 2. [8M]
- b) With a neat sketch explain the operation of Four Quadrant Multiplier. [8M]
6. a) Design a monostable multivibrator using 555 timer to produce a pulse width of 100 m sec. [8M]
- b) Derive the expressions for i) Lock in range. ii) Capture range. [8M]
7. a) Draw a weighted resistor DAC and obtain the transfer characteristics of a 3 bit DAC. [8M]
- b) Draw and explain the circuit operation of Successive approximation ADC. [8M]

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