

Code No: RT31042

R13

SET - 1

III B. Tech I Semester Supplementary Examinations, May-2017

LINEAR IC APPLICATIONS

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

Time: 3 hours

Max. Marks: 70

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

PART -A

- 1 a) Draw and explain the circuit diagram of basic current mirror. [4M]
- b) The input signal to an op-amp is $0.03 \sin(1.5 \times 10^5 t)$. What can be the maximum gain of an op-amp with the slew rate of $0.4 \text{ V}/\mu\text{s}$? [4M]
- c) Explain how the average circuit can be derived from the summer. [3M]
- d) What are the characteristics of all pass filters? [3M]
- e) Describe the PPM using 555 timer mono stable multi vibrator. [4M]
- f) The LSB of a 10-bit DAC is 20 mV . Calculate the output voltage for an input, 1011001101. [4M]

PART -B

- 2 For a Dual input balanced output differential amplifier $R_C = 47 \text{ k}\Omega$, $R_{S1} = R_{S2} = 20 \text{ k}\Omega$, $R_1 = 43 \text{ k}\Omega$, $h_{fe} = 75$, $h_{ie} = 20 \text{ k}\Omega$, $V_{CC} = 9 \text{ V}$, $V_{EE} = -9 \text{ V}$ and $V_{BE} = 0.7 \text{ V}$ calculate i) operating point values ii) A_d iii) A_c iv) CMRR in dB [16M]
- 3 a) Discuss briefly about stability of an op-amp. [8M]
- b) Explain about the concept of frequency compensation. [8M]
- 4 a) Derive the frequency response of a practical integrator. [8M]
- b) Design a practical integrator circuit with a D.C gain of 20, to integrate a square wave of 25 kHz . [8M]
- 5 a) Explain the operation of Narrow band pass filter with a neat diagram. [6M]
- b) Design a multiple feedback Narrow band pass filter with $f_c = 1 \text{ kHz}$, $Q = 3$ & $A_f = 10$. [10M]
- 6 Describe the 555 timer monostable multivibrator applications in i) Frequency divider ii) Pulse width modulation. [16M]
- 7 a) With neat sketch explain the principle and operation of successive approximation ADC. [8M]
- b) With neat sketch explain the operation of Dual slope ADC. [8M]
