

Code No.: EC403PC

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CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS

II-B.TECH-II-Semester End Examinations (Supply) - February- 2024
LINEAR IC APPLICATIONS
(ECE)

[Time: 3 Hours]

[Max. Marks: 70]

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(20 Marks)

1. a) List out the DC characteristics. [2M]
- b) What are the characteristics of ideal op-amp? [2M]
- c) Define voltage regulator and multivibrator. [2M]
- d) Draw sample and hold circuit. [2M]
- e) Define oscillator .What are the conditions for oscillations. [2M]
- f) $R=1K\Omega, C=0.01\mu F$,Find the f_o of wein bridge oscillator. [2M]
- g) Draw the circuit diagram of Log amplifier. [2M]
- h) Write the applications of 555 timer. [2M]
- i) What is the necessity of digital to analog conversion? [2M]
- j) What are the drawbacks of weighted register DAC? [2M]

PART-B

(50 Marks)

- 2.a) Explain non inverting op-amp with neat circuit diagram. [5M]
 - b) Design an inverting amplifier with a gain of -10 and input resistance of $10k\Omega$. [5M]
- OR**
- 3.a) Explain the application of op-amp with inverting, non inverting mode in closed loop configuration. [5M]
 - b) What is an Op-amp? Briefly explain the function of different stages of an Op-amp with respect to its block schematic. [5M]
- 4.a) Draw the circuit diagram of an integrator and explain its working. [5M]
 - b) Design an instrumentation amplifier to have a variable differential gain in the range 5-200. Use a 50 kilo-ohm potentiometer. [5M]
- OR**
5. Describe the working of practical differentiator circuit. Derive the expression for output voltage. [10M]
- 6.a) Discuss in detail about band pass filter with neat sketch [5M]
 - b) Explain the operation of the first order low pass filter. [5M]
- OR**
7. What is VCO, draw and explain the functional block diagram of VCO. [10M]

8. Draw and explain the circuit of an astable multivibrator using 555 timer. [10M]

OR

9.a) Draw and explain the principles and description of individual blocks of PLL in detail. [5M]

b) Compute the free running frequency f_0 , lock in range and capture range of PLL 565. [5M]
Assume $R_T=20k\text{-ohm}$, $C_T=0.01\mu\text{F}$, $C=1\mu\text{F}$ and supply voltage is $\pm 6\text{v}$.

10.a) Draw and explain the operation of weighted resistor DAC? [5M]

b) Find out step size and analog output for 4-bit R-2R ladder DAC, when input is 0 1 1 1 and 1 1 1 1, assume $V_{ref} = +5\text{V}$. [5M]

OR

11.a) With neat sketch explain the principle and operation of successive approximation. [7M]
ADC

b) Enlist the advantages and disadvantages of dual slope ADC. [3M]
