

Code No.: EC403PC

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CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
II-B.TECH-II-Semester End Examinations (Supply) July - 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) Draw the pin diagram of IC741. [2M]
- b) Define offset current, bias current. [2M]
- c) Draw the multiplier block diagram. [2M]
- d) What is the main drawback in basic integrator circuit? [2M]
- e) Draw the circuit diagram of saw tooth wave generator. [2M]
- f) What are the differences between RC phase shift oscillator and Wein bridge oscillator? [2M]
- g) What is the role of comparator in 555 timer? [2M]
- h) List the applications of 555 timer. [2M]
- i) What is the drawback of weighted register DAC? [2M]
- j) What are the features of IC 1408 DAC? [2M]

PART-B

(50 Marks)

2. Discuss about different modes of operations of op-amp. [10M]
- OR**
3. What are the ideal characteristics of op-amps? Explain in detail about classifications of integrated circuits. [10M]
4. Draw the circuit diagram of Instrumentation Amplifier with transducer bridge, explain the operation, derive the equation for output voltage. [10M]
- OR**
5. (a) With neat sketch explain the operation of integrator, and derive the equation for output voltage. [5M]
- (b) In the practical integrator circuit, the input is a sine wave with a peak to peak amplitude of 5V at 1kHz. Draw the output voltage wave form if $R_1 C_F = 0.1\text{ms}$ and $R_F = 10R_1$. Assume that the voltage across C_F is initially zero. [5M]
6. (a) Draw the circuit diagram of first order high pass filter and derive the equation for cutoff frequency. [5M]
- (b) Design a high pass filter at a cut off frequency of 1kHz with a pass band gain of 3, and also plot the frequency response of the filter. [5M]
- OR**
7. Draw the circuit diagram of Wein bridge oscillator and derive the equation for frequency of oscillation. [10M]

8. (a) Explain the block diagram of 555 timer. [5M]
(b) Draw the circuit diagram of astable multi vibrator and derive the equation for frequency of oscillation. [5M]

OR

9. (a) With neat sketch explain the operation of Schmitt trigger using 555 timer. [5M]
(b) Briefly explain the role of low pass filter and VCO in PLLs. [5M]

10. (a) In a binary weighted D/A converter $R_F=11.2K\Omega$, determine the size of each step? [5M]
What is the output voltage when inputs b_0 through b_3 are at 5V?
(b) Define the following terms for D/A converters: Resolution, settling time, conversion time, accuracy. [5M]

OR

11. (a) Draw the circuit diagram and give a short notes on each block in SAR. Convert 29V Analog signal into Digital signal using Successive approximation type ADC. [5M]
(b) For the D/A converter using R-2R Ladder network determine step size if $R_F=27K\Omega$, Calculate the output voltage when the inputs b_0, b_1, b_2 and b_3 are at 5V. [5M]
