

**R18**

Code No: 154BH

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B. Tech II Year II Semester Examinations, September/October - 2023**

**LINEAR IC APPLICATIONS**

**(Common to ECE, EIE)**

**Time: 3 Hours**

**Max. Marks: 75**

**Note:** i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

**PART – A**

**(25 Marks)**

- 1.a) State the limitations of IC technology. [2]
- b) A Differential amplifier has a differential voltage gain of 2000 and common mode gain of 0.2. Determine CMRR. [3]
- c) Write a short note on op amp multiplier. [2]
- d) Discuss about multivibrator. [3]
- e) Write about Barkhausen criteria. [2]
- f) Discuss about all pass filter. [3]
- g) Define capture and lock range. [2]
- h) Enlist the important features of 555 timer circuit. [3]
- i) Calculate the number of bits required to represent a full scale voltage of 10V with a resolution of 5mV approximately. [2]
- j) What is the drawback of weighted resistor DAC? Write down the method to overcome this drawback. [3]

**PART – B**

**(50 Marks)**

- 2.a) Write a short note on IC classification.
  - b) List and explain the DC characteristics of an operational amplifier. [5+5]
- OR**
- 3.a) Prove that the differential amplifier with unity gain is a subtractor using op-amp.
  - b) Compare the ideal and practical characteristics of IC741. [5+5]
- 4.a) With neat figures, describe the working of an integrator using op-amp.
  - b) Define Schmitt Trigger and explain about the working of Schmitt trigger in detail. [5+5]
- OR**
- 5.a) Explain inverting and non-inverting comparator.
  - b) Explain the non-inverting AC amplifier. [5+5]
- 6.a) Design a second order active butterworth HPF with a cutoff frequency of 2Khz.
  - b) Discuss about a triangular wave generator using op-amp. [5+5]
- OR**
- 7.a) Explain about twin - T network in notch filter using op-amp.
  - b) Derive the frequency of oscillations for quadrature oscillator. [5+5]

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- 8.a) Draw the functional block diagram and explain the characteristics of IC 555.
- b) What is PLL? How frequency multiplication is done in PLL? [5+5]

**OR**

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- 9.a) Explain the working of 555 timer as astable multivibrator and derive an expression for the frequency of oscillation.
- b) Explain with functional block diagram the operation of 566 voltage controlled oscillator. [5+5]

- 10.a) Explain the counter type ADC with suitable diagram.
- b) Explain about ladder type DAC with neat diagram. [5+5]

**OR**

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- 11.a) Explain the operation of Dual slope ADC with neat sketches.
- b) Explain the DAC and ADC specifications. [5+5]

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