

Code No: R1641022

**R16**

**Set No. 1**

**IV B.Tech I Semester Supplementary Examinations, July/Aug – 2021**

**LINEAR IC APPLICATIONS**  
**(Electrical and Electronics Engineering)**

**Time: 3 hours**

**Max. Marks: 70**

*Question paper consists of Part-A and Part-B*

*Answer ALL sub questions from Part-A*

*Answer any FOUR questions from Part-B*

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**PART-A(14 Marks)**

1. a) What is the functionality of Level translator? [2]
- b) List out the classification of ICs. [2]
- c) What is a precision rectifier? [2]
- d) What are the advantages of active filters over passive filter? [2]
- e) Define Capture range and pull in time related to PLL. [3]
- f) Calculate the values of the LSB, MSB and full scale output for an 8-bit DAC for the 0 to 10 V range? [3]

**PART-B(4x14 = 56 Marks)**

2. a) Derive the expression for voltage gain, input resistance and output impedance of dual input balanced output differential amplifier? [7]
- b) With the help of neat diagram explain the Cascaded differential amplifier stages? [7]
3. a) Draw the block diagram of Op-amp and explain each block? [4]
- b) Define and explain the following:
  - i) Input offset voltage
  - ii) Input offset current [6]
- c) A square wave of peak to peak amplitude of 500 mV has to be amplified to a peak-to-peak amplitude of 3 volts, with a rise time of 4  $\mu$ s or less. Can a 741 be used? [4]
4. a) Explain how a non-symmetrical square wave can be obtained? [4]
- b) Design an Op-amp differentiator that will differentiate an input signal with  $f_{\max} = 100$  Hz. [4]
- c) Draw the circuit diagram of voltage to current converter if the load is (i) floating and (ii) grounded. If there is any limitation on the size of the load when grounded? [6]
5. a) Design a wideband reject filter having  $f_h = 400$  Hz and  $f_l = 2$  KHz having a pass band gain as 2. [7]
- b) Explain in detail about of four quadrant multiplier? [7]



6. a) Explain the operation of Astable multivibrator using 555 timer with neat diagrams? [7]
- b) Design a PLL circuit using IC 565 to get
- i) Free running frequency = 4.5KHz
  - ii) Lock range of 2KHz
  - iii) Capture range = 100Hz
- Assuming a supply voltage of  $\pm 10V$ . Show the circuit diagram with all component values. [7]
7. a) Explain the operation of R-2R ladder DAC with the help of neat diagram? [7]
- b) Explain the important specifications of DAC/ADC converters? [7]

