

**II B. TECH II SEMESTER REGULAR EXAMINATIONS, AUG/SEP 2021**  
**LINEAR IC APPLICATIONS**  
(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 60

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Note: Answer **ONE** question from each Unit (**5 × 12 = 60 Marks**)

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UNIT - I

1. a) Explain the procedure to compute the operating point of a differential amplifier which is operating in Dual Input Balanced Output configuration. [6M]
- b) What are the different types of packages in which the commercial op-amp is available? [6M]

(OR)

2. a) Draw the voltage transfer characteristics of an operational amplifier with the help of necessary equations. [6M]
- b) Draw the pin diagram of IC741 and list out its specifications. [6M]

UNIT – II

3. a) With the help of neat circuit diagram explain about the difference amplifiers and then derive the mathematical expression related to its output. [6M]
- b) Design a lossy integrator so that peak gain is 20dB and the gain is 3dB down from its peak value when  $\omega = 10000\text{rad/s}$ . Use a capacitance of  $0.01\mu\text{F}$ . [6M]

(OR)

4. a) Explain about the op-amp based I to V converters. [6M]
- b) Explain the concept of precision rectifiers in the context of op-amp applications. [6M]

UNIT – III

5. a) Design a IC741 based first order Low pass filter with passband gain of 2 and higher cut-off frequency of 2KHz. [6M]
- b) Explain the design procedure of an op-amp based first order High pass filter. [6M]

(OR)

6. a) Draw the circuit diagram of an op-amp based all pass filter and explain the operation. [6M]
- b) Explain the operation of sample and hold circuit. [6M]

UNIT –IV

7. a) Draw the circuit of IC555 Timer based Monostable multivibrator and then derive the expression for the time period of the quasi stable state. [6M]
- b) Explain the operation of an IC555 timer based Schmitt trigger circuit with the help of necessary waveforms. [6M]

(OR)

8. a) What are the important blocks of PLL. Explain the significance of each of the blocks. [6M]
- b) Explain the operation of a monolithic PLL. [6M]

UNIT –V

9. a) Draw the circuit diagram of a R-2R ladder type DAC. Derive the expression for the output of it for a given digital input. [6M]
- b) Explain the working principle of the successive approximation type ADC with the help of block diagram. [6M]

(OR)

10. a) Explain the mechanism involved in the analog to digital conversion using counter type ADC. [6M]
- b) Explain the operation of a Dual-Slope ADC. [6M]

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