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Dec-22-0161

EC-403 (Linear Integrated Circuits)

B.Tech-4th (CBCS)

Time : 3 Hours

Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note: Attempt Five questions in all, selecting one question from each Section A, B, C and D. Section E is compulsory.

SECTION-A

1. What is an OP-AMP? Give the characteristics and equivalent circuit of ideal OP-AMP? (10)
2. Write a short note on TL082. (10)

SECTION B

3. (a). Design an Op-Amp differentiator that will differentiate an input signal with $f_{max} = 100$ Hz. (5)
(b). Draw the output waveform for a sine wave of 1V peak at 100Hz applied to the differentiator. (5)
4. Define, draw and explain the Bessel, Butterworth and Chebyshev filters and compare their response. (10)

SECTION C

5. Draw and explain the circuit of a clipper which will clip the input signal below a reference voltage. (10)
6. Design a monostable multivibrator with trigger pulse shaping which drive a LED ON for 0.5 second each time it is pulsed. (10)

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SECTION D

7. Explain PLL with block diagram. Define capture range, lock range and pull-in-time in detail. (10)
8. Explain Zener diode voltage regulator in detail with clear diagram. (10)

SECTION E

9. Answer the following: (10×2=20)
 - a. What is a practical op-amp? Draw its equivalent circuit.
 - b. State the condition for oscillations.
 - c. Write the difference between Astable Multivibrator and Monostable Multivibrator.
 - d. Define common mode rejection ratio.
 - e. What is the roll off rate of a first order filter?
 - f. Give the characteristics of standard regulator IC.
 - g. List the applications of PLL.
 - h. What is the difference between Fixed and adjustable voltage regulators?
 - i. What is precision rectifier?
 - j. What is the difference between inverting and non-inverting amplifier?