

**THE KAVERY ENGINEERING COLLEGE**  
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

*Fourth Semester*

*Electrical and Electronics Engineering*

EE3402 - Linear Integrated Circuits

*Regulations - 2021*

*Duration : 3 Hrs*

*Maximum : 100 Marks*

**PART – A (ANSWER ALL QUESTIONS) (Marks 10\*2=20)**

| <i>Q.No</i> | <i>Questions</i>                                             | <i>BLT</i> | <i>CO</i> | <i>Marks</i> |
|-------------|--------------------------------------------------------------|------------|-----------|--------------|
| 1.          | Define IC fabrication.                                       | RE         | 1         | 2            |
| 2.          | Label the process of epitaxial growth in IC fabrication.     | RE         | 1         | 2            |
| 3.          | Explain the ideal and DC characteristics of an OP-AMP.       | UN         | 2         | 2            |
| 4.          | What is the frequency response of an OP-AMP?                 | RE         | 2         | 2            |
| 5.          | Explain the working of an instrumentation amplifier.         | UN         | 3         | 2            |
| 6.          | List out the applications of log and antilog amplifiers.     | RE         | 3         | 2            |
| 7.          | Tell the functional block of the 555 Timer.                  | UN         | 4         | 2            |
| 8.          | Outline the characteristics of a phase-locked loop (PLL) IC. | UN         | 4         | 2            |
| 9.          | Compare LM317 and 723 voltage regulators.                    | UN         | 5         | 2            |
| 10.         | Infer the role of the ICL 8038 function generator.           | UN         | 5         | 2            |

**PART – B (ANSWER ALL QUESTIONS) (Marks 5\*13 = 65)**

| <i>Q.No</i> | <i>Questions</i>                                                                    | <i>BLT</i> | <i>CO</i> | <i>Marks</i> |
|-------------|-------------------------------------------------------------------------------------|------------|-----------|--------------|
| 11.         | a i Discuss the monolithic IC fabrication process.                                  | UN         | 1         | 7            |
|             | ii Explain the packaging of monolithic ICs.                                         | UN         | 1         | 6            |
|             | Or                                                                                  |            |           |              |
|             | b i Describe the fabrication of a PV cell.                                          | UN         | 1         | 7            |
|             | ii Explain the etching process in IC fabrication.                                   | UN         | 1         | 6            |
| 12.         | a Derive the transfer function for inverting amplifier and non-inverting amplifier. | UN         | 2         | 13           |
|             | Or                                                                                  |            |           |              |
|             | b Explain the operation of an integrator circuit using an OP-AMP.                   | UN         | 2         | 13           |
| 13.         | a i Explain the working principle of an analog multiplier and its applications.     | UN         | 3         | 7            |
|             | ii Outline a first-order active filter and derive its transfer function.            | UN         | 3         | 6            |
|             | Or                                                                                  |            |           |              |

|     |   |    |                                                                                   |    |   |    |
|-----|---|----|-----------------------------------------------------------------------------------|----|---|----|
|     | b | i  | Discuss the operation of comparators with relevant applications.                  | UN | 3 | 7  |
|     |   | ii | What is a peak detector? Derive its working principle.                            | UN | 3 | 6  |
| 14. | a | i  | Describe the characteristics and applications of the 555 Timer in PWM.            | UN | 4 | 7  |
|     |   | ii | Explain the operation of a voltage-controlled oscillator (VCO) using IC-566.      | UN | 4 | 6  |
| Or  |   |    |                                                                                   |    |   |    |
|     | b | i  | Explain the concept of an Analog multiplier using AD633.                          | UN | 4 | 7  |
|     |   | ii | Discuss the application of the phase-locked loop (PLL) in frequency synthesis.    | UN | 4 | 6  |
| 15. | a |    | Explain the working of an instrumentation amplifier with a load cell application. | UN | 5 | 13 |
| Or  |   |    |                                                                                   |    |   |    |
|     | b |    | Explain the operation of a SMPS with an example.                                  | UN | 5 | 13 |

*PART – C (Marks 1\*15 = 15)*

| <i>Q.No</i> | <i>Questions</i> |                                                                   | <i>BLT</i> | <i>CO</i> | <i>Marks</i> |
|-------------|------------------|-------------------------------------------------------------------|------------|-----------|--------------|
| 16.         | a                | Discuss the fabrication process of a diode and its applications.  | UN         | 1         | 15           |
| Or          |                  |                                                                   |            |           |              |
|             | b                | Explain the application of an IC in analog-to-digital conversion. | UN         | 3         | 15           |