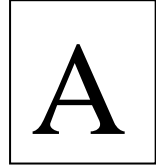**SNS College of Technology, Coimbatore-35.**
**(Autonomous)**
**B.E/B.Tech Internal Assessment -I**
**Academic Year 2022-2023(ODD)**
**Third Semester**
**Electronics and Communication Engineering**
**19ECB204 – Linear and Digital Circuits**

**A**

**Time: 1$^{1/2}$ Hours**                                                        **Maximum Marks: 50**

**Answer All Questions**

**PART - A (5 x 2 = 10 Marks)**

|     |                                                                          | CO | Blooms |
|-----|--------------------------------------------------------------------------|-----|--------|
| 1.  | Define an Integrated circuit.                                             | CO1 | Rem    |
| 2.  | Outline the characteristics of an ideal op-amp.                          | CO1 | Und    |
| 3.  | Why integrators are preferred over differentiators in analog computers?  | CO1 | App    |
| 4.  | Distinguish between Schmitt trigger and comparator.                       | CO2 | Ana    |
| 5.  | List out the applications of 555 timer.                                   | CO2 | Ana    |

**PART – B (2 x 13 = 26 Marks)**

|     |     |                                                                                          |    | CO  | Blooms |
|-----|-----|------------------------------------------------------------------------------------------|----|-----|--------|
| 6.  | (a) | Analyze the DC and AC Characteristics of an Operational Amplifier.                       | 13 | CO1 | Ana    |
|     |     | (or)                                                                                      |    |     |        |
|     | (b) | Outline the operation of an adder and subtractor using Op-Amp.                           | 13 | CO1 | Und    |
| 7.  | (a) | Explain the functional block of IC555 Timer circuit and its characteristics with necessary diagrams | 13 | CO2 | Und    |
|     |     | (or)                                                                                      |    |     |        |
|     | (b) | Examine the Voltage regulators and its types with suitable expressions and diagrams.     | 13 | CO2 | Ana    |

| PART – C (1 x 14 = 14 Marks) | | | | |
|---|---|---|---|---|
| | | | **CO** | **Blooms** |
| 8. | (a) | How the RC integrator and differentiator work? The input of a passive RC integrator circuit is wired to a resistance, and the output voltage is drawn from across a resistance. How the signal was produced by the integrator and differentiator? | 14 | CO1 | Und |
| | | (or) | | | |
| | (b) | Design an Instrumentation Amplifier for the Heart Rate Measurement with Low Power Consumption | 14 | CO2 | App |
| | | *********************** | | | |

**Abbreviations:**

**CO** – Course Outcomes; **Rem-** Remembering; **Und –** Understanding; **App –** Applying; **Ana –** Analyzing

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**B**

**Time: 1$^{1/2}$ Hours**                                      **Maximum Marks: 50**

**Answer All Questions**

**PART - A (5 x 2 = 10 Marks)**

|  |  | CO | Blooms |
|---|---|---|---|
| 1. | Define an Operational Amplifier | CO1 | Rem |
| 2. | Compare ideal and practical characteristics of an op-amp. | CO1 | Und |
| 3. | Why integrators are preferred over differentiators in analog computers? | CO1 | App |
| 4. | What is a zero crossing detector? | CO2 | Ana |
| 5. | List out the major blocks of 555 timer functional diagram | CO2 | Rem |
| **PART – B (2 x 13 = 26 Marks)** | | | |
|  |  | CO | Blooms |
| 6. | (a) | Analyze the ideal Characteristics of an Operational Amplifier. | 13 | CO1 | Ana |
|  |  | (or) | | | |
|  | (b) | Outline the operation of V to I and I to V convertors using Op-Amp. | 13 | CO1 | Und |
| 7. | (a) | Explain the working of Comparator and zero crossing detector in detail. | 13 | CO2 | Und |
|  |  | (or) | | | |
|  | (b) | Discuss the applications of IC555 Timer with appropriate circuits and waveforms. | 13 | CO2 | App |

| | | PART – C (1 x 14 = 14 Marks) | | CO | Blooms |
|---|---|---|---|---|---|
| 8. | (a) | Design a half wave and centre tapped full wave rectifier, then analyse the voltage signal it produces. | 14 | CO1 | Ana |
| | | (or) | | | |
| | (b) | Design an Inverting, Non-inverting adder with neat circuit diagram and derive its mathematical expressions. | 14 | CO2 | App |
| | | ********************* | | | |

**Abbreviations:**

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