**SRM Institute of Science and Technology**

Mode of Exam

**OFFLINE**

**SET B**

**College of Engineering and Technology**

**DEPARTMENT OF ECE**

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

**Academic Year: 2021-2022 (EVEN)**

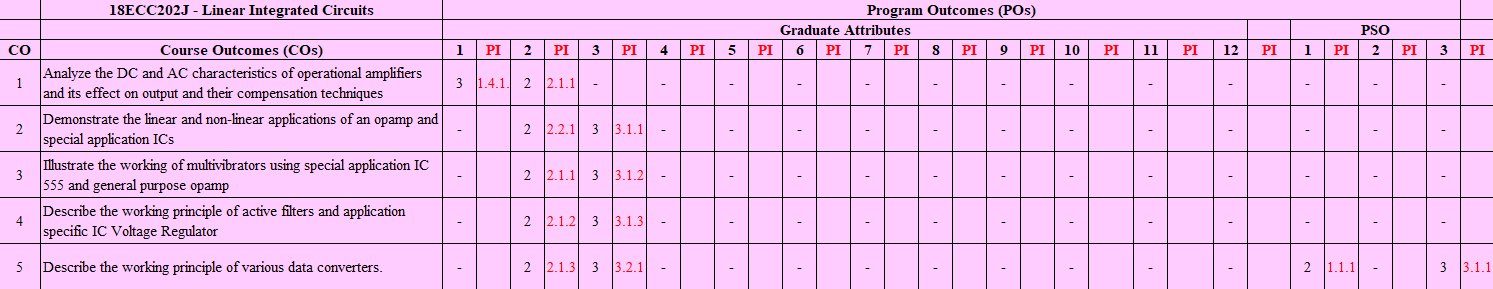
**Batch 2**

**Test: CLAT-2** **Date: 31/05/22**

**Course Code & Title:** 18ECC202J / Linear Integrated Circuits **Duration:** 2 Periods

**Year & Sem:** II year / IV Sem **Max. Marks:** 50

**Course Articulation Matrix:**

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| --- | --- | --- | --- | --- | --- | --- |
| **Part - A**  **(10 x 1 = 10 Marks)**  **Instructions: Answer ALL Questions** | | | | | | |
| **Q. No** | **Question** | **Marks** | **BL** | **CO** | **PO** | **PI** |
| **1.** | In positive clipper, when the input voltage is higher than the reference voltage, then the op-amp operates in,  A. Open loop  B. Closed loop  C. Backward loop  D. Forwarded loop | **1** | **1** | **2** | **2** | **2.2.1** |
| **2.** | For the precision diode to conduct, the minimum amplitude of input voltage is: A. VγAoL  B. Vγ/AoL  C. Vγ  D. AoL / Vγ | **1** | **1** | **2** | **2** | **2.2.1** |
| **3.** | In a differentiator, the circuit is made more sensitive to high frequency noise, when the input impedance,  A. Decreases with the decrease in frequency  B. Decreases with the increase in frequency  C. Increases with the decrease in frequency  D. Increases with the increase in frequency | **1** | **1** | **2** | **2** | **2.2.1** |
| **4.** | Find the scaling factor of an inverting amplifier if RF=3MΩ and R1 = 3KΩ  A. 1000  B. -1000  C. 10-3  D. -104 | **1** | **1** | **2** | **2** | **2.2.1** |
| **5.** | Consider V0 and Vi is same both in magnitude and phase, then the circuit is called \_\_\_\_\_\_\_\_\_\_\_  A. Summer  B. Differential amplifier  C. Subractor  D. Voltage follower | **1** | **1** | **2** | **2** | **2.2.1** |
| **6.** | The condition to produce sustained oscillation in the Wein bridge oscillator is ….. | **1** | **1** | **3** | **2** | **2.1.1** |
| **7.** | The purpose of Pin 5 in IC 555 timer is ………..  A. GND  B. Triangular output  C. VCC  D. Modulation input | **1** | **1** | **3** | **2** | **2.1.1** |
| **8.** | The frequency range for which the Phase locked loop maintains lock is called ………….  A. Lock in range B. Capture range  C. Pull in time D. Pull out time | **1** | **1** | **3** | **2** | **2.1.1** |
| **9.** | In voltage-controlled oscillator the output voltage of Schmitt trigger varies from \_\_\_\_\_\_\_\_\_\_\_  A. 0.5Vcc to 0.25 Vcc  B. Vcc to 0.5Vcc  C. 0 to Vcc  D. 0.5Vcc to 0.75Vcc | **1** | **1** | **3** | **2** | **2.1.1** |
| **10.** | Find the duty cycle of an astable multivibrator operating at a frequency of 100Hz with a discharge time of 5ms.  A. 50% B. 75%  C. 95.99% D. 37.5% | **1** | **3** | **3** | **2** | **2.1.1** |
| **Part – B**  **( 4 x 10 = 40 Marks)** | | | | | |  |
| **SECTION B1**  **Instructions: Answer ANY 2 Questions** | | | | | |  |
| 11 | Design an op-amp to differentiate an 100 Hz signal and draw the output waveform for a sine input of 1V peak to peak. | 10 | 3 | 2 | 3 | 3.1.1 |
| 12 | With a neat diagram, explain the working principle of log amplifiers and derive the expression for the output voltage. Brief how stable reference voltage is obtained. | 10 | 3 | 2 | 2 | 2.2.1 |
| 13a | Describe voltage to current convertor with grounded load | 4 | 2 | 2 | 2 | 2.2.1 |
| 13b | Identify the circuit to measure and control the physical quantities in industrial applications. Explain its working principle and derive the expression for output voltage? | 6 | 4 | 2 | 3 | 3.1.1 |

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| --- | --- | --- | --- | --- | --- | --- |
| **SECTION B2**  **Instructions: Answer ANY 2 Questions** | | | | | | |
| 14 | With a neat diagram, explain the operation of saw tooth wave generator. | 10 | 3 | 3 | 2 | 2.1.1 |
| 15a | Describe the operation of 555 timer in astable mode with necessary schematic and derive the expression for the total time period. | 8 | 3 | 3 | 2 | 2.1.1 |
| 15b | Obtain the value of capacitor C of a monostable multivibrator for a resistor value of 100 KΩ and for a time delay of 100 ms. | 2 | 3 | 3 | 3 | 3.1.2 |
| 16a | Design a RC phase shift oscillator to oscillate at 1KHz. (Choose C = 0.01µF) | 4 | 4 | 3 | 2 | 2.1.1 |
| 16b | Give a detailed account on the applications of the Phase Locked Loop. | 6 | 2 | 3 | 2 | 2.1.1 |

**Course Outcome (CO) and Bloom’s level (BL) Coverage in Questions**

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**Approved by the Course Coordinator Signature of the Question paper setter**

**Evaluation Sheet**

**Name of the Student: Register No.:**

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| --- | --- | --- | --- | --- | --- |
| **Part- A (10 x 1= 10 Marks)** | | | | | |
| **Q. No** | **CO** | **PO** | **Maximum Marks** | **Marks Obtained** | **Total** |
| **1** | **CO2** | **2** | **1** |  |  |
| **2** | **CO2** | **2** | **1** |  |
| **3** | **CO2** | **2** | **1** |  |
| **4** | **CO2** | **2** | **1** |  |
| **5** | **CO2** | **2** | **1** |  |
| **6** | **CO3** | **2** | **1** |  |
| **7** | **CO3** | **2** | **1** |  |
| **8** | **CO3** | **2** | **1** |  |
| **9** | **CO3** | **2** | **1** |  |
| **10** | **CO3** | **2** | **1** |  |
| **Part- B (4 x 10= 40 Marks)** | | | | | |
| **11** | **CO2** | **3** | **10** |  |  |
| **12** | **CO2** | **2** | **10** |  |
| **13a** | **CO2** | **2** | **4** |  |
| **13b** | **CO2** | **3** | **6** |  |
| **14** | **CO3** | **2** | **10** |  |
| **15a** | **CO3** | **2** | **8** |  |
| **15b** | **CO3** | **3** | **2** |  |
| **16a** | **CO3** | **2** | **4** |  |
| **16b** | **CO3** | **2** | **6** |  |

**Consolidated Marks:**

|  |  |  |
| --- | --- | --- |
| **CO** | **Maximum Marks** | **Marks Obtained** |
| **2** | **35** |  |
| **3** | **35** |  |
| **Total** |  |  |

|  |  |  |
| --- | --- | --- |
| **PO** | **Maximum Marks** | **Marks Obtained** |
| **2** | **52** |  |
| **3** | **18** |  |
| **Total** |  |  |

**Signature of Course Teacher**

**Signature of the Course Coordinator Signature of the Academic Advisor**