**POORNIMA UNIVERSITY, JAIPUR**

**END SEMESTER EXAMINATION, November 2022**

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|  | **3BT5103** | Roll No. | Total Printed Pages: 2 |
| **3BT5103** |  |
| B. Tech. III Year V- Semester (Main/Back) End Semester Examination, November 2022  **(EC)** | |
| **BEC05102 : Linear Integrated Circuits** | | | |

# Time: **3** Hours. Total Marks: **60**

Min. Passing Marks: **21**

Attempt **five** questions selecting one question from each Unit. There is internal choice from Unit I to Unit V. Marks of each question or its parts are indicated against each question / parts. Draw neat sketches wherever necessary to illustrate the answer. Assume missing data suitably (if any) and clearly indicate the same in the answer.

Use of following supporting material is permitted during examination for this subject.

# **1.--------------------------Nil--------------------** **2.------------------Nil-----------------------**

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|  |  | **UNIT-I (CO1)** | **Marks** | **Bloom Level** |
| **Q.1** | **(a)** | Draw the block schematic of op-amp and briefly explain each block. | **(6)** | **Create** |
|  |  |  |  |  |
|  | **(b)** | Calculate the input and output resistances for the dual input balanced output differential amplifier. Consider the specifications as given,. | **(6)** | **Evaluate** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.2** | **(a)** | Draw the circuit diagram of a dual input balanced output differential amplifier and perform its DC and AC analysis. | **(6)** | **Create** |
|  |  |  |  |  |
|  | **(b)** | List the four differential amplifier configuration. Which is most commonly used and why? | **(6)** | **Remember** |
|  |  |  |  |  |
|  |  | **UNIT-II (CO2)** |  |  |
|  |  |  |  |  |
| **Q.3** | **(a)** | Draw the circuits of ideal Differentiator. Also draw and explain their frequency responses. | **(6)** | **Create** |
|  |  |  |  |  |
|  | **(b)** | Design a Wien bridge oscillator at frequency fo = 500 Hz. | **(6)** | **Create** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.4** | **(a)** | Design R-C phase shift oscillator which gives the sinusoidal waveform of 400Hz. | **(6)** | **Create** |
|  |  |  |  |  |
|  | **(b)** | Explain the working of a triangular waveform generator and derive the expression for frequency of oscillations. | **(6)** | **Understand** |
|  |  |  |  |  |
|  |  | **UNIT-III (CO3)** |  |  |
|  |  |  |  |  |
| **Q.5** | **(a)** | Explain the All pass filter with help of circuit diagram. | **(6)** | **Understand** |
|  |  |  |  |  |
|  | **(b)** | Design a wide band pass filter having Fl = 400 Hz, Fh = 2KHz and pass band gain of 4. Find the Q value of the filter. | **(6)** | **Create** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
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| **Q.6** | **(a)** | Draw the circuit diagram of Twin-T notch narrow band Reject Filter and derive expression for cut-off frequencies. | **(6)** | **Create** |
|  |  |  |  |  |
|  | **(b)** | Define Bessel, Butterworth and Chebyshev filters, and compare their response. | **(6)** | **Remember** |
|  |  |  |  |  |
|  |  | **UNIT-IV (CO4)** |  |  |
|  |  |  |  |  |
| **Q.7** | **(a)** | What are various operating modes of 555 IC? Also explain the working principle of free running multivibrator. | **(6)** | **Understand** |
|  |  |  |  |  |
|  | **(b)** | Design a regulated power supply of + 9V using 3 terminal voltage regulated IC. | **(6)** | **Create** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.8** | **(a)** | What do you mean by ‘Voltage Regulator’? Differentiate between positive and negative voltage regulator with examples. | **(6)** | **Remember** |
|  |  |  |  |  |
|  | **(b)** | Write short note on Four Quadrant Multiplier. | **(6)** | **Understand** |
|  |  |  |  |  |
|  |  | **UNIT V (CO5)** |  |  |
|  |  |  |  |  |
| **Q.9** | **(a)** | Define capture range, lock range and pull in time of PLL. Why capture range always smaller than the lock range. | **(6)** | **Remember** |
|  |  |  |  |  |
|  | **(b)** | Briefly describe the role of PLL in the following applications: (**any one**)   1. Am Detector (ii) Frequency translator | **(6)** | **Understand** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.10** | **(a)** | Describe the application of PLL as: (**any two**)   1. FM detector (ii) FSK demodulator (iii) Tracking Filter | **(12)** | **Understand** |