End Term Examination
(CBCS)(SUBJECTIVE TYPE) (OffLine)
Course Name: B.Tech. ECE, Semester:4
(May, 2025)

| Subject Code: BEC 202 | Subject: Linear Integrated Circuits (LIC) |
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| Time: 3 Hours | Maximum Marks :60 |

**Note: Q1 is compulsory. Attempt one question each from the Units I, II, III & IV.**

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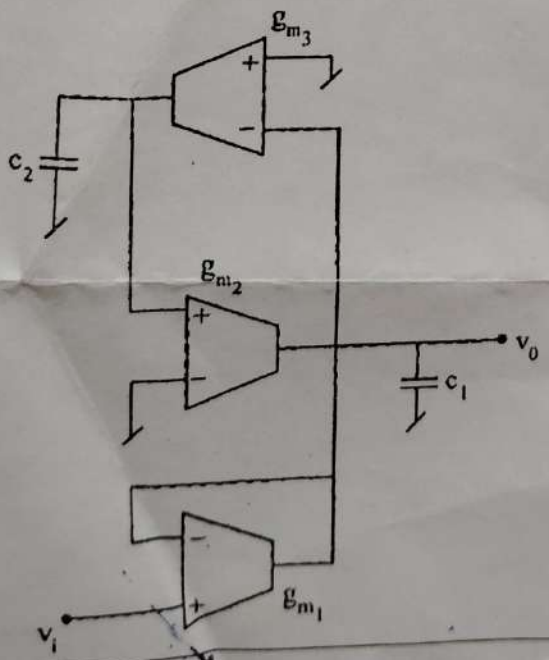
| Q1 | | (2.5*8=20) | CO Mapping |
| | a) The output voltage of Op-amp is changes by 20V in 4μsec. What is the slew rate of Op-amp? | | CO1 |
| | b) Explain the virtual ground concept with a suitable example. | | CO1 |
| | c) What is precision diode? What part it plays in a half wave rectifier? | | CO2 |
| | d) Explain the basic principle of a RC Phase shift oscillator. | | CO2 |
| | e) Give limitations of an Operational Transconductance Amplifier (OTA). | | CO3 |
| | f) Discuss the power conversion efficiency of a Class A Amplifier. | | CO3 |
| | g) For which applications active filters are preferred over passive filters and why? | | CO4 |
| | h) What is a phase detector? What are its types? | | CO4 |
| | **UNIT I** | | CO Mapping |
| Q2 | Explain the meaning of open loop and closed loop operation of an op-amp. Discuss different circuits and their working for both types of operation of Op-Amp. | (10) | CO1 |
| Q3 | Discuss about the various methods used for improving CMRR of the Op-Amp. | (10) | CO1 |
| | **UNIT II** | | CO Mapping |
| Q4 | Draw the circuit of a Monostable Multivibrator using Op-Amp. Explain its operation and find out the mathematical expression for pulse width 'T' for the monostable multivibrator. | (10) | CO2 |
| Q5 | Design an op-amp differentiator that will differentiate an input signal with $f_{max}$ = 500 Hz. Draw the output waveform for a sine wave of 2V peak at 200 Hz applied to the differentiator. | (10) | CO2 |
| | **UNIT III** | | CO Mapping |
| Q6 | Find the transfer function of the circuit given in Figure below:   | (10) | CO3 |

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| Q7 | Explain the operation of Class A Push-Pull Amplifier. Give circuit diagram and detailed working. | (10) | CO3 |
| | **UNIT IV** | | CO Mapping |
| Q8 | Design a fifth order Butterworth low-pass filter having upper cut-off frequency 2kHz. | (10) | CO4 |
| Q9 | Write short notes on the following:-<br>(a) Monostable operation of 555 Timer<br>(b) Block schematic of Phase Locked Loop (PLL) | (10) | CO4 |