



G H RAISONI INSTITUTE OF ENGINEERING & TECHNOLOGY, NAGPUR

(Approved by AICTE, New Delhi and Recognized by DTE, Maharashtra)

An Autonomous Institute Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur

Accredited by NAAC with A+ Grade



T No.

END SEM EXAMINATION

WINTER - VACATION 2023

Name of Program:	Bachelor of Technology (BTECH) in ELECTRONICS & TELECOMMUNICATION ENGINEERING	Sem:	3 rd
Name of Course :	Analog Integrated Circuits	Course Code	UECL205
Max Marks:	50 Marks	Duration:	150 Mins.

INSTRUCTION TO THE STUDENTS

1. Read the question paper carefully (Branch, Semester, Scheme) before attempting the questions.
2. Solve Q. 1 OR Q. 2 remaining questions are mandatory
3. Every question has equal weightage.
4. Use of programmable calculator is prohibited.
5. Assume suitable data wherever necessary.
6. Draw neat and proper diagram/sketches.
7. Don't use red pen for writing the answers.
8. Don't write any other comments except answers of questions.

ABBREVIATIONS

Q.: Question Number S.Q.: Sub Question Number BT: Blooms taxonomy Level CO: Course Outcome

LIST OF COURSE OUTCOME

- CO1: Apply knowledge of differential amplifier to design operational amplifier.
CO2: Make use of op-amps fundamentals and computer tools in project design, evaluation and analysis.
CO3: Design real time applications using filters & oscillators.
CO4: Experiment with op-amp based circuits required in communications and embedded systems.
CO5: Design and develop analog applications using different ICs.

Q.	S.Q.	Question	Marks	BT Level	CO
1	a	Design dual input balanced output differential amplifier for the following specifications: $R_C=2.2K\Omega$, $R_E=4.7K\Omega$, $V_{CC}=15V$, $-V_{EE}=-15V$ and transistor having $\beta_{dc}=\beta_{ac}=100$ and $V_{BE}=0.6V$. i) Determine the I_{CQ} and V_{CEQ} ii) Determine the voltage gain iii) Determine input and output resistance	06	6	CO1
	b	Explain in details Current mirror circuit using BJT with suitable diagram.	04	2	CO1
OR					
2	a	Perform DC analysis of differential amplifier.	05	3	CO1
	b	Explain in detail Level Translator circuit with suitable diagram.	05	2	CO1



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Q.	S.O.	Question	Marks	BT Level	CO
3	a	Explain the significance of Practical Differentiator over Basic Differentiator circuit using Op.Amp. Draw the frequency response of both types of Differentiator circuits.	05	6	CO2
	b	Define the following terms: i) Input offset voltage ii) Input offset current iii) Input bias current iv) CMRR v) PSRR	05	1	CO2
4	a	Design the second order high pass Butterworth filter using operational amplifier for a cut off frequency of 2 KHz.	05	6	CO3
	b	Explain RC phase shift oscillator in detail.	05	2	CO3
5	a	Explain positive clipper circuit with input output waveform.	05	2	CO4
	b	Explain peak detector circuit using Op Amp with circuit diagram and required waveforms.	05	2	CO4
6	a	Compare Astable, Monostable and Bistable multivibrator using IC 555.	06	5	CO5
	b	Explain IC based voltage regulator circuit.	04	2	CO5

