

Hall Ticket Number:

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Code No. : 15351 N/O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

B.E. (E.E.E.) V-Semester Main & Backlog Examinations, Jan./Feb.-2024

Linear Integrated Circuits & Applications

Time: 3 hours

Max. Marks: 60

Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	List the non-ideal dc characteristics of an OP-AMP.	2	1	1	1,2
2.	What is CMRR? What is the CMRR of an ideal OP-AMP?	2	1	1	1,2
3.	Draw the circuit of a regenerative comparator.	2	3	2	1,2
4.	Write the limitations of diode as a rectifier? How are they overcome in precision op-amp rectifiers?	2	2	2	1,2
5.	Draw the basic block diagram of PLL.	2	3	3	1,2
6.	Describe the Wein bridge oscillator.	2	2	3	1,2
7.	Discuss current fold back operation in voltage regulator.	2	2	4	1,2
8.	Mention the limitations of linear voltage regulators.	2	2	4	1,2
9.	List the important parameters of a filter.	2	2	5	1,2
10.	Discuss state variable filter.	2	2	5	1,2
Part-B (5 × 8 = 40 Marks)					
11. a)	Derive the expressions for gain, input, output resistance, and bandwidth of a feedback non inverting amplifier?	4	3	1	1,2
b)	Design a practical differentiator to differentiate at 10 KHz using OP-Amp.	4	3	1	1,2
12. a)	Describe the operation of an inverting Schmitt trigger circuit with neat sketch.	4	1	2	1,2
b)	By deriving necessary expressions explain the operation of an Instrumentation amplifier	4	3	2	1,2
13. a)	Design the 555 timer as an astable multivibrator for 50KHz and duty ratio 75%.show the circuit.	4	4	3	1,2
b)	Analyze the operation of a triangular wave generator. Derive the equation for frequency of oscillations.	4	4	3	1,2

Contd... 2

14. a)	Explain the working of shunt voltage regulator by using Op-amp.	4	2	4	1,2
b)	Define and explain dual tracking voltage regulators.	4	1	4	1,2
15. a)	Design a wide BPF having $f_l = 400\text{Hz}$, $f_h = 2\text{KHz}$ and pass band gain of '4'. Find Q of the filter.	4	4	5	1,2
b)	Explain the operation of switched capacitor filter.	4	3	5	1,2
16. a)	Discuss the different offset balancing techniques for an Op-Amp?	4	1	1	1,2
b)	Explain the operation of clippers and clampers with neat waveforms.	4	2	2	1,2
17.	Answer any <i>two</i> of the following:				
a)	What is quadrature oscillator? Explain the principle of operation of quadrature oscillator. Also derive the conditions of frequency of oscillations with its advantages and disadvantages.	4	2	3	1,2
b)	Explain current sensing and current feedback protection schemes for voltage regulators.	4	2	4	1,2
c)	Design a second order Butterworth LPF for 1 KHz cutoff frequency.	4	3	5	1,2

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	35%
iii)	Blooms Taxonomy Level – 3 & 4	45%
