Hall Ticket Number:

Code No. : 31321

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD B.E. (ECE) III Year I-Semester Main & Backlog Examinations, December-2017

Linear Integrated Circuits and Applications

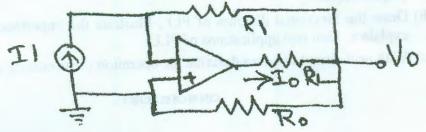
Time: 3 hours

Max. Marks: 70

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

Part-A $(10 \times 2 = 20 \text{ Marks})$

- 1. Define Input offset voltage and Explain why it exists in all opamps?
- 2. A 741C op-amp is used as an inverting amplifier with a gain of 50. The voltage gain (vs) frequency curve of 741C is flat upto 20kHz. What maximum peak to peak input signal can be applied without distorting the output.
- 3. Draw the circuit of a precision rectifier and mention its importance
- 4. For the circuit shown below, if $R_1 = 2k\Omega$, $R_0 = 4k\Omega$, $R_L = 3k\Omega$. If $I_1 = mA$, Find the value of I_0 ?



- 5. Distinguish between basic comparator and the Schmitt trigger?
- 6. Design a first order LPF so that it has a cut off frequency of 2 kHz and a pass band gain of 2.
- 7. Define Lock range and Capture range of PLL
- 8. How do we vary the duty cycle of an astable multi vibrator using 555 Timer?
- 9. Define Resolution, Accuracy and Monotonicity of digital to analog converters.
- 10. The basic step of a 9 -bit DAC is 10.3mV. If 000000000 represents 0V, what output is produced if the input is 101101111?

Part-B (5 × 10 = 50 Marks)

11. a) Describe the operation of circuits which improves CMRR. [5] b) Illustrate the operation of external pole-zero frequency compensation method in [5] operational amplifiers. 12. a) Discuss about the practical differentiation and derive the necessary expression. [5] b) Mention the important features of Instrumentation amplifier and derive the expression of [5] the output voltage. 13. a) Construct the triangular wave form generator using op-amp and derive the expression for [6] the frequency. b) Design a wide band pass filter having $f_1 = 400$ Hz, $f_h = 2$ kHz and passband gain of 4. [4] Find the value of Q of the filter.

14.	a) Draw functional diagram of a 555 timer and using the above design monostable multivibrator to produce a pulse width of 100ms.	[5]
	b) Give the block diagram of IC 566 VCO and explain the functionality of each block.	[5]
15.	 a) i) List the various ADC Conversion techniques. ii) Explain the operation of dual slope ADC and mention the importance of dual slope ADC. 	[6]
	b) How current boosting is achieved in a 723 IC?	[4]
16.	a) Draw the block diagram of the operational amplifier. List ac and dc parameters of op-amp.	[4]
	b) Draw the circuit of an ideal integrator and explain its operation .What are the limitations of an ideal integrator .How these limitations can be overcome?	[6]
17.	Answer any two of the following:	
	a) Construct the Square wave generator using op-amp and derive the expression of output frequency.	[5]

- b) Draw the functional diagram of PLL. Illustrate the importance of each block and [5] explain at least two applications of PLL.
- c) With neat circuit diagram describe the operation of successive approximation ADC. [5]

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Part-B (5 = 10 - 10 Markey

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