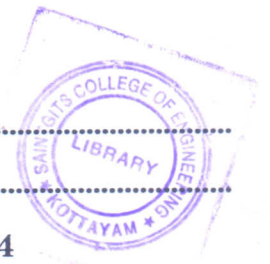


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Reg. No.....

Name.....



B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

Fifth Semester

Branch : Electrical and Electronics Engineering

LINEAR INTEGRATED CIRCUITS (E)

(Old Scheme—Supplementary/Mercy Chance)

[Prior to 2010 Admissions]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions briefly.

Each question carries 4 marks.

1. What is a level translator ? Where it is used in 741 ? What is its function ?
2. Draw the equivalent circuit of an op-amp and explain its parameters.
3. Draw the circuit of a regenerative comparator and explain its voltage transfer characteristics.
4. Explain the functioning of a sample and hold circuit, giving its applications.
5. Explain the advantages of active filters.
6. Compare and contrast the merits of parallel and dual slope ADC.
7. Describe the lock range and capture range of a PLL on its characteristics.
8. Explain how PLL can be used for FM demodulation.
9. Draw the circuit of a shunt zener voltage regulator and explain how it regulates the output voltage when the input increases.
10. Discuss the applications of 555.

(10 × 4 = 40 marks)

Part B

Answer all questions.

Each full question carries 12 marks.

11. (a) Define the following parameters of op-amp :—

- | | |
|-------------------------|----------------------------|
| (i) Input bias current. | (ii) Input offset current. |
| (iii) CMRR. | (iv) SVRR. |

(8 marks)

Turn over

- (b) An op-amp has a differential gain of 90 dB and CMRR of 100 dB. If $V_1 = 1 \mu\text{V}$ and $V_2 = 0.8 \mu\text{V}$, calculate the differential and common mode output voltage.

(4 marks)

Or

12. Draw the temperature compensated logarithmic amplifier using op-amp and diode. Explain its working and derive expression for its output voltage.

13. (a) Draw the circuit of a Schmitt trigger for LTP = + 2 volt and UTP = + 5.5 volt. Design your circuit and derive the formula used.

(8 marks)

- (b) Draw the circuit of a precision full-wave rectifier and explain with its waveforms. (4 marks)

Or

14. With circuit and necessary waveforms, explain the working of an astable multivibrator which generates square waves of 600 Hz with 60 % duty cycle. Derive expression for its frequency.

15. Explain the circuit of a R-2R DAC. Derive expression for its output voltage. Assume input is 4 bits.

Or

16. With the help of neat diagrams, explain the working of an ADC which does not require the reconversion of digital output to its analog equivalent.

17. With necessary circuit diagram, describe how PLL can be used as a frequency multiplier.

Or

18. Describe the AM demodulator operation by PLL. What are its merits compared to other AM detectors ?

19. With internal functional block diagram and waveform explain how 555 can be used as a monostable multivibrator. Show how this can be used as a divide-by-3 counter. Draw waveforms.

Or

20. With functional internal block diagram, explain how 723 works. Show the circuit diagrams for a output voltage of 10 volt, with foldback protection, $I_{L\text{max}} = 200 \text{ mA}$.

(5 × 12 = 60 marks)

