

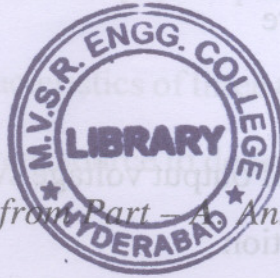
FACULTY OF ENGINEERING

B.E. 3/4 (EE/Inst.) I Semester (Main) Examination, December 2010

LINEAR INTEGRATED CIRCUITS

Time : 3 Hours]

[Max. Marks : 75



Note : Answer all questions from Part – A. Answer five questions from Part – B.

PART – A

(25 Marks)

1. Define CMRR. Give typical value for a 741 Opamp. 3
2. Design an amplifier using OPAMP to provide a gain of -5 and input resistance equal to $10\text{ k}\Omega$. 2
3. Draw the circuit of a regenerative comparator. 2
4. List any three applications of instrumentation amplifiers. 3

5. Match the following : 3

A

B

- | | |
|----------------------|--|
| i) Analog Multiplier | a) Frequency Divider |
| ii) 555 Timer | b) AM communication |
| iii) Dual Slope ADC | c) Phase angle detection |
| | d) Measurement of slowly varying signals |
| | e) Time marker generator |

6. A triangular wave can be generated by 2
- differentiating a square wave
 - differentiating a linear ramp.
 - integrating a square wave
 - integrating a linear ramp.
7. To control average value of output voltage switching mode regulators rely on 2
- Pulse amplitude modulation
 - Pulse width modulation
 - Pulse position modulation
 - None of these
8. Define input regulation and give it's typical value. 3
9. i) Audio filters are usually _____ type. 2
- ii) Poor pulse response is a characteristic of _____ filter.
10. Draw the frequency response characteristics of a notch filter. 3

PART – B

(50 Marks)

11. a) Explain with the help of circuit and frequency response characteristics the operation of an Opamp differentiator. 5
- b) What are the problems associated with the above circuit ? Explain how they are overcome in a practical differentiator. 5
12. a) Explain the operation of an analog multiplier. 5
- b) A voltage of $10 \sin 2\pi \times 10^3 t$ is applied to a squarer circuit employing analog multiplier. Find the output voltage for a reference voltage of 10 V. 5



13. a) With the help of a block schematic, explain the operation of a phase locked loop. 5
- b) Define lock-in range, capture range, and pull-in time in relation to PLL. 5
14. a) List and explain the characteristics of three terminal IC regulators. 5
- b) Using 7805 design a current source to deliver 200 mA current to a 22Ω , 10W load. 5
15. a) Explain the operation of a wide-band pass filter and list it's important parameters. 5
- b) Design a wide -band pass filter having $f_l=400$ Hz, $f_h=2$ KHz and passband gain of 4. Find Q of the filter. 5
16. a) Describe the operation of a peak detector. What are it's applications ? 5
- b) Explain the principle of operation of a quadrature oscillator. 5
17. Explain the following : 5
- a) 555 Timer 5
- b) State Variable Filter. 5