Code No. : 3031

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 kΩ. **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

a) differentiating a square wave

b) differentiating a linear ramp.

c) integrating a square wave

d) integrating a linear ramp.

7. To control average value of output voltage switching mode regulators rely on 2

a) Pulse amplitude modulation

b) Pulse width modulation

c) Pulse position modulation

d) None of these

8. Define input regulation and give it's typical valve. 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 22 Ω, 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 :

    a) 555 Timer 5

    b) State Variable Filter. 5