

III B.Tech I Semester Regular Examinations, November 2007
LINEAR IC APPLICATIONS
(Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain how large open circuit voltage gain of an op - amp can be obtained by using cascading of differential amplifier stages.
(b) Explain ac analysis of differential amplifier. [8+8]
2. (a) Calculate the effect of variation in power supply voltages on the output offset voltage for an op - amp circuit.
(b) Why frequency compensation is required for an op - amp and explain frequency compensation technique using suitable diagrams. [6+10]
3. (a) Design a differentiator to differentiate an input signal that varies in frequency from 10 Hz to about 1KHz. If a sine wave of 1V peak at 1000 Hz is applied to this differentiator draw the output waveforms.
(b) Why active differentiator circuits are not used in analog computer to solve differential equations. [10+6]
4. (a) Derive the expression of the output voltage of an antilog amplifier using op - amp.
(b) Design a saw tooth wave form generator using op - amp and plot the waveforms for the given specifications frequency: 5kHz, $V_{sat} = \pm 15V$ (Assume necessary data). [8+8]
5. (a) For the all pass filter, determine the phase shift ϕ between the input and output at $f = 2kHz$. To obtain a phase shift ϕ , what modifications are necessary in the circuit?
(b) Derive the expression for the transfer function of 2nd order High pass filter. [8+8]
6. (a) Explain the operation of Monostable multivibrator using 555 timer. Derive the expression of time delay of a Monostable multivibrator using 555 timer.
(b) Design monostable multivibrator using 555 timer to produce a pulse width of 100 m sec. [10+6]
7. (a) What are the basic blocks preceding an Analog to Digital converter in a typical application like digital audio recording?
(b) With the help of a neat circuit diagram and waveforms, explain the operation of a dual slope ADC. What are its special features? [6+10]
8. Write short notes on:

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Set No. 3

- (a) IC 1496 and its applications
- (b) Sample and hold circuit.

[16]
