

[06 – 3111]

III/IV B.E. DEGREE EXAMINATION.

First Semester

Electrical and Electronics Engineering

LINEAR ICs AND APPLICATIONS

(Common for Electrical and Electronics Engineering
and Electronics and Communication Engineering, EIE
and M.S. ECE and EEE)

(Effective from the Admitted Batch of 2004–2005)

Time : Three hours

Maximum : 70 marks

Answer Q.No. 1 is compulsory.

Answer any FOUR from the remaining questions.

All questions carry equal marks.

1. (a) Define input bias current and slew rate.
- (b) Draw the circuit of practical differentiator and mention how it eliminate practical problems.
- (c) Write the expression for frequency of oscillations for RC phase shift oscillator. Also write the condition for it.

- (d) Draw the peak detector circuit along with waveforms.
 - (e) What is notch filter? State application of it.
 - (f) Write the applications of monostable multivibrator using 555 timer.
 - (g) What is VCO? Mention the applications of VCO.
2. (a) Derive the output voltage for three input non-inverting averaging amplifier.
- (b) Why frequency compensation is required in opamp? Explain two frequency compensation techniques for opamp.
3. (a) Draw the circuit of Integrator and obtain an expression for output voltage.
- (b) Design a square wave generator using opamp to generate a waveform with a frequency of 2 kHz.
4. (a) Draw the schematic diagram of a Wien bridge oscillator and explain its working. Also obtain the condition for frequency of oscillations.
- (b) Explain the working of logarithmic amplifier with neat circuit diagram.

5. (a) In the Schmitt trigger circuit, $R_1 = 33 \text{ k}\Omega$, $R_2 = 56 \text{ }\Omega$, $v_i = 1 \text{ V}$ peak to peak sine wave of frequency 50 Hz , $V_{ref} = 0 \text{ V}$ and opamp 741 is used with supply voltages of $\pm 15 \text{ V}$. Assume saturation voltages are $\pm 13.5 \text{ V}$. Determine the threshold voltages V_{UT} and V_{LT} .
- (b) Draw the sample and hold circuit and explain its working with neat waveforms.
6. (a) Design an astable multivibrator using 555 timer for a frequency of 1 kHz with a duty cycle of 70% .
- (b) Draw the PLL circuit as frequency multiplier and explain.
7. (a) Draw the circuit of first order active high pass filter and derive the expressions for gain and cut off frequency.
- (b) Design a narrow band bandpass filter with $f_c = 2 \text{ kHz}$, $Q = 20$ and $A_F = 10$.
8. (a) Define a filter. How the filters are classified?
- (b) Draw the circuit of voltage to current converter with grounded load and explain.