[EEC-204]
B.Tech. Degree Examination

ECE & EEE
IV SEMESTER

LINEAR INTEGRATED CIRCUITS
(Effective from the admitted batch 2015–16 onwards)

Time: 3 Hours   Max.Marks: 60

Instructions: Each module carries 12 marks.
Answer all modules choosing one question from each module
All parts of the module must be answered in one place only.
Figures in the right hand margin indicate marks allotted.

MODULE-I

1. a) Explain effect of bias current on output voltage.   6
    b) For a particular op-amp, the input offset current is 20nA while
        input bias current is 60nA. Calculate the values of two input bias
        currents.   6

OR

2. a) Plot and explain frequency response of an op-amp.   6
    b) An op-amp operates as a unity gain buffer with 3V (peak to peak)
        square wave input. If op-amp is ideal with slew rate 0.5V/μsec,
        find the maximum frequency of operation.   6

MODULE-II

3. a) What is a differentiator? Draw a circuit of the same using op-amp
        and explain its operation.   6
    b) Design a practical integrator circuit with a DC gain of 10, to
        integrate a square wave of 10KHz.   6

OR

4. a) Why and where instrumentation amplifiers used? Draw a circuit
        of the same and explain its operation.   6
    b) Draw a circuit which converters voltage to current and explain its
        operation in detail. What are its applications?   6

MODULE-III

5. a) Draw the schematic diagram of monostable multivibrator and explain its operation.   6

   b) Bring out the difference between fixed output and adjustable output voltage regulators.   6

OR

6. a) Explain Schmitt trigger circuit with different UTP and LTP levels.   6

   b) Design an op-amp Schmitt trigger with following specifications. UTP=2V, LTP=−4V and the output swings between (+10V to -10V). If input is $5\sin\omega t$, plot the waveforms of input and output.   6

MODULE-IV

7. a) Explain the operation of second order high pass Butterworth filter with a neat sketch of circuit.   6

   b) Design a high pass filter with a cut-off frequency of 10KHz with a passband gain of 1.5.   6

OR

8. a) Obtain the transfer function of all pass filter.   6

   b) For all pass filters, the values of R and C are 7.95KΩ and 0.02μF respectively. If the input frequency is 1.5KHz, calculate the phase shift.   6

MODULE-V

9. a) Draw the typical dual slope converter and explain.   6

   b) For a particular dual slope ADC, t_1 is 83.33ms and the reference voltage is 100mV. Calculate t_2, if
      i) V_1 is 100mV and ii) V_1 is 200mV   6

OR

10. a) Explain the tracking type ADC converter.   6

    b) State the advantages of tracking converter over counter type converter.   6

[4,5/IV S/119]