R13

B.Tech III Year I Semester (R13) Supplementary Examinations June 2016
LINEAR IC APPLICATIONS
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

PART – A
(Compulsory Question)
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1   Answer the following: (10 X 02 = 20 Marks)
  (a)   Define differential amplifier.
  (b)   Draw the op-amp equivalent circuit.
  (c)   Write the properties of ideal op-amp.
  (d)   What is the compensating network?
  (e)   Draw the op-amp integrator circuit.
  (f)   Write about the first order and second order filter.
  (g)   How the name implies 555 timers.
  (h)   Write the applications of PLL.
  (i)   Write the disadvantage of weighted resistor DAC.
  (j)   List out the ADC techniques.

PART – B
(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2   (a)   List and compare the different configurations of differential amplifier.
    (b)   What is level translator? Explain the necessity of level translator stage in cascading differential amplifiers.
OR
3   (a)   Explain the term slew rate and write the importance in op-amp circuits.
    (b)   For the given dual-input, balanced-output differential amplifier R_C = 2.2 kΩ, R_E = 4.7 kΩ, R_{in1} = R_{in2} = 50 Ω, V_{CC} = +10 V, V_{EE} = -10 V, $β_{DC}$ = $β_{AC}$ = 100 and V_{BE} = 0.71 V, determine I_{CQ}, V_{CEQ}, r_e, voltage gain, input and output resistances.

UNIT – II

4   (a)   Compare voltage series and voltage shunt feedback circuits.
    (b)   Derive the expression for closed-loop gain.
OR
5   (a)   Write the difference between compensating and uncompensating networks.
    (b)   The op-amp non-inverting amplifier has the following parameters R_1= 1 kΩ, R_f = 10 kΩ, A = 2,00,000, R_i = 2 MΩ, R_o = 75 Ω, supply voltages V_{CC} = +15 V, V_{EE} = -15 V. Determine A_f, R_{if} & R_{of}.

UNIT – III

6   (a)   Derive the expression for 3 input summing amplifier with circuit diagram.
    (b)   What is the need of Current to Voltage Converter?
OR
7   (a)   The op-amp non-inverting summing circuit has the following parameters V_{CC} = +15 V, V_{EE} = -15 V, R = R_1 = 1 kΩ, R_f = 2 kΩ, V_1 = +2 V, V_2 = -3 V, V_3 = +4 V. Determine the output voltage V_o.
    (b)   Write the design steps of the second order low pass filter and draw its circuit.

UNIT – IV

8   Draw and explain the operation of Wein bridge oscillator and write its frequency expression
OR
9   (a)   How to design the function generator
    (b)   The monostable circuit used as divide by 2 network. The input frequency of trigger signal is 2 kHz, if C = 0.01µF, calculate the value of R_A.

UNIT – V

10   Draw and explain the successive approximation ADC.
OR
11   Draw and explain in detail about R-2R DAC.
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