Code: 13A04503 **R13**

B.Tech III Year I Semester (R13) Supplementary Examinations June 2017

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)

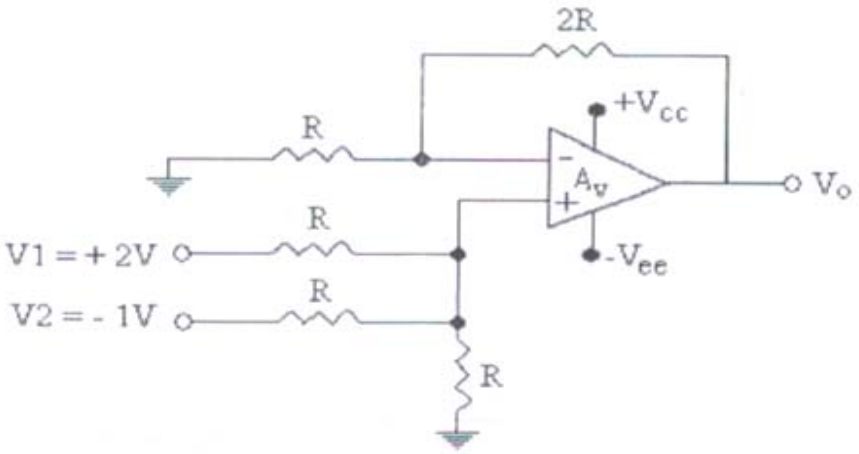
(a) Draw the ideal voltage transfer curve of op amp.

(b) What are the ideal characteristics of op amp?

(c) Derive the expression for the gain for inverting amplifier with feedback.

(d) Define slew rate.

(e) Calculate the output voltage V_0 for the following non-inverting op amp summer.



(f) List out the advantages of active filter.

(g) Draw the output wave form for non-inverting comparator with negative reference.

(h) List out the applications of analog multiplier.

(i) Define resolution and accuracy.

(j) Compare successive approximation, dual slope and flash type ADC's.

PART – B

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

UNIT – I

2 (a) Draw the JFET input operational amplifier using dual Op-amp and explain its operation.

(b) Draw and describe the various functional blocks of an operational amplifier IC. Explain each block.

OR

3 (a) Write the small signal analysis of differential amplifier.

(b) Derive CMRR from the above analysis.

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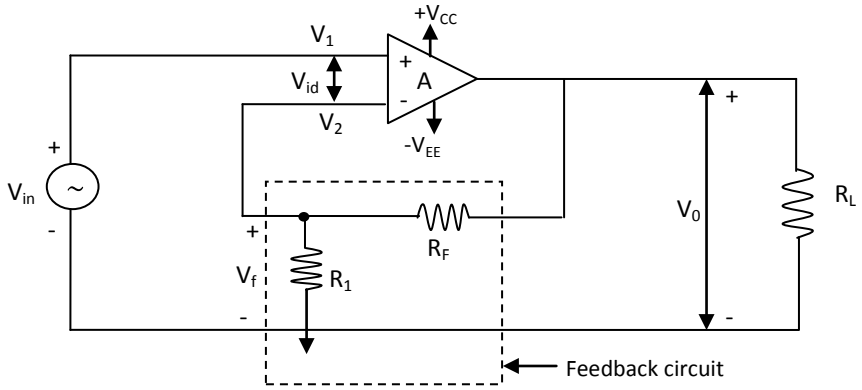
UNIT – II

4 (a) List out the four negative feedback configurations. How does negative feedback effect on the performance of inverting amplifier? Explain.

(b) Explain internally compensated op amp with the help of frequency response.

OR

5 (a) The 741C Op-amp having the following parameters is connected as a non inverting amplifier show in figure below, with R_1 = 1 kΩ, R_F = 10 kΩ, A = 2000, R_i = 1 MΩ, R_0 = 75 kΩ, f_0 = 5 Hz. Compute the values of A_F, R_{iF}, R_{0F}, f_F.



(b) Define stability? Explain clearly about the stability of an Op-amp

UNIT – III

6 (a) Draw and explain the circuit diagram of instrumentation amplifier and derive the expression for gain.

(b) Design an Op-amp differentiator that will differentiate an input signal with f_{max} = 100 Hz.

OR

7 (a) Design a second order low pass filter at high cutoff frequency of 1 kHz.

(b) Draw the frequency response of the network in part (a).

UNIT – IV

8 (a) Draw the circuit diagram of Wein Bridge oscillator. Derive the expression for its gain and frequency of oscillations.

(b) A 555 timer Astable multi vibrator uses R_A = 6.8 kΩ, R_B = 3.3 kΩ and C = 0.1 μF. Calculate the free running frequency of oscillations.

OR

9 (a) Draw the block diagram of PLL. Explain one of the applications of PLL.

(b) Derive the Equation for the gate width of 555 monostable multivibrator with neat sketches.

UNIT – V

10 (a) Draw & explain the circuit diagram of successive approximation ADC. Write down its limitations.

(b) Calculate the values of the LSB, MSB and full scale output for an 8 bit DAC for the 0 to 10 V range.

OR

11 (a) Draw the circuit diagram of inverted R-2R ladder DAC network. Explain its working. List out the advantages over R-2R ladder network.

(b) Discuss about the over sampling in A/D converters.

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