Indian Institute of Technology, Delhi
ELL304 Analog Circuits
Tutorial 7, 10 September 2015

1. In Figure 1, find out the transfer function of the circuit.

2. Evaluate the operation of the circuit in Fig 2. Show that the gain is R_C/R_E as the op-amp gain approaches ∞.

3. In Figure 3, deduce the output of the circuit. Note, there is no input. Time domain will probably work favorably for your analysis.

4. An inverting amplifier uses an op-amp whose frequency response is $A(s) = \omega_u/s$. Determine the transfer function of the closed loop circuit and compute the bandwidth. Re-work the bandwidth when the op-amp has a different model, i.e., $A(s) = A/(1 + s/\omega_p)$. Compare the two answers.

5. An inverting amplifier circuit has to be designed for a gain of -5, with a maximum error of 1%, for frequencies upto 1 MHz. What should be the DC gain of the op-amp to be used? What should be the unity-gain frequency of the op-amp?

6. A non-inverting amplifier circuit is to be designed for a gain of +5, with a maximum error of 1%, for frequencies upto 1 MHz. What should be the DC gain of the op-amp to be used? What should be the unity-gain frequency of the op-amp?

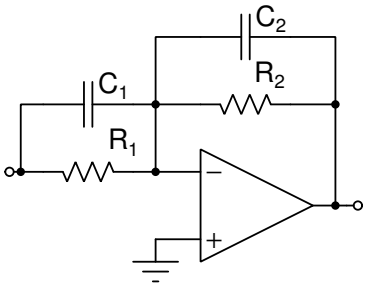

Figure 1

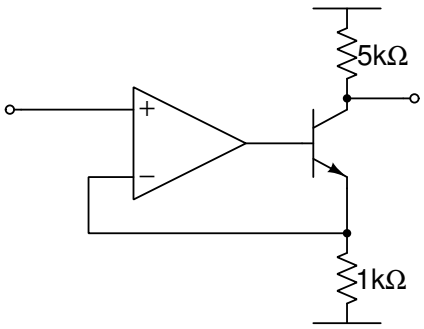

Figure 2

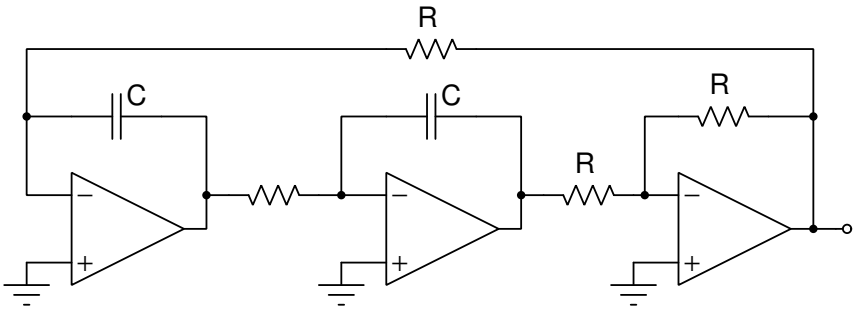

Figure 3