Simulation Exercise

Q1 a) Write the netlist for the lowpass filter shown in Fig.1. Run the simulation to obtain frequency response of the filter and verify the cut-off frequency and gain for Vin = 4Vp-p. Sweep the frequency in the appropriate range.

   b) Change value of capacitor C to 0.47uF and R2 to 6.8KΩ. See the effect.
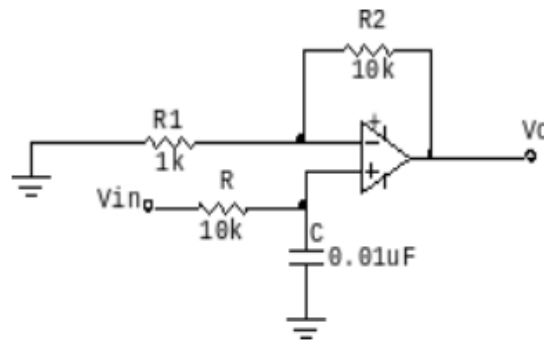

Figure 1

Q2 a) Write the netlist for the highpass filter shown in Fig.1. Run the simulation to obtain frequency response of the filter and verify the cut-off frequency and gain for Vin = 4Vp-p. Sweep the frequency in the appropriate range.

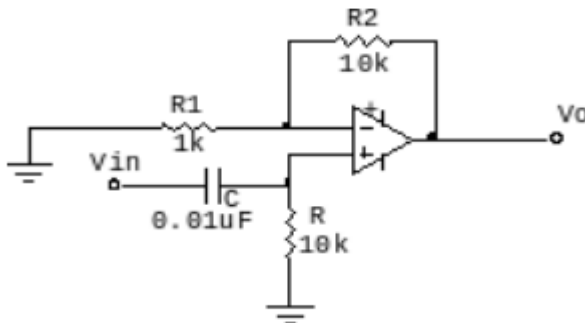   b) Change value of capacitor C to 0.47uF and R2 to 6.8KΩ. See the effect.

Figure 2

Q3 a) Write the netlist for the band pass filter shown in Fig.3. Run the simulation to obtain frequency response of the filter and verify the centre frequency and gain for Vin = 4Vp-p. Sweep the frequency in the appropriate range.

   b) Change value of capacitor C1 to 0.47uF and R2 to 6.8KΩ See the effect. Now change C2 to 0.1uF and see the effect.
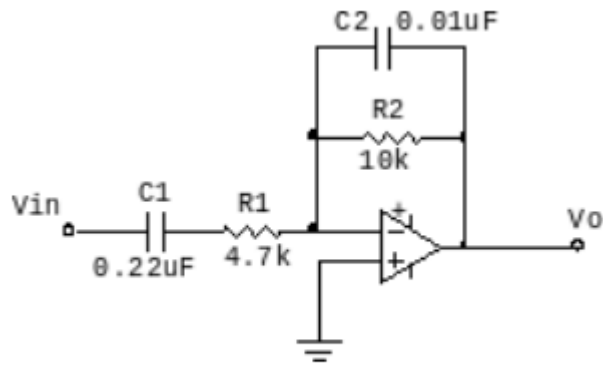
Figure 3

Q2. a) Design a Butterworth low pass filter for cut-off frequency 15 KHz and pass band gain of 8. Write ngspice netlist, run the simulation and verify the filter specifications.

b) Design a Butterworth high pass filter for cut-off frequency 15 KHz and pass band gain of 8. Write ngspice netlist, run the simulation and verify the filter specifications.

c) Design a band pass filter with centre frequency of 5Hz and gain of 8. Write ngspice net list, run the simulation and verify the filter specifications.