SANTA CLARA UNIVERSITY	ELEN 115 Spring 2023	Dr. S. Krishnan
Pre-Lab #3: Operational Amplifier Applications		

I. OBJECTIVES

- To analyze various operational amplifier circuits
- To learn how to build amplifier topologies and active filters and study their performance

II. PRE-LAB

1. A 741 operational amplifier is used to construct an active low pass filter circuit with
   (1) a DC voltage gain of **-15 V/V**
   (2) a input resistance of **2KΩ**
   (3) a 3dB frequency of **5KHz**

   (a) Show clearly the steps you follow to do your filter design.
   (b) Use a 741 for the operational amplifier indicating clearly the pin numbers on the symbol of the 741opamp. Assign DC power supplies of ±15V to the opamp.
   (c) If the sinusoidal voltages below are given as input to the amplifier what would be the output voltage. Provide a hand drawn plot on graph paper that shows the input and output voltage waveforms.
      (i) $v_{IN}(t) = 2 + 0.1\sin 2\pi t$
      (ii) $v_{IN}(t) = 0.1\sin 1000\pi t$
      (iii) $v_{IN}(t) = 0.1\sin 40000\pi t$