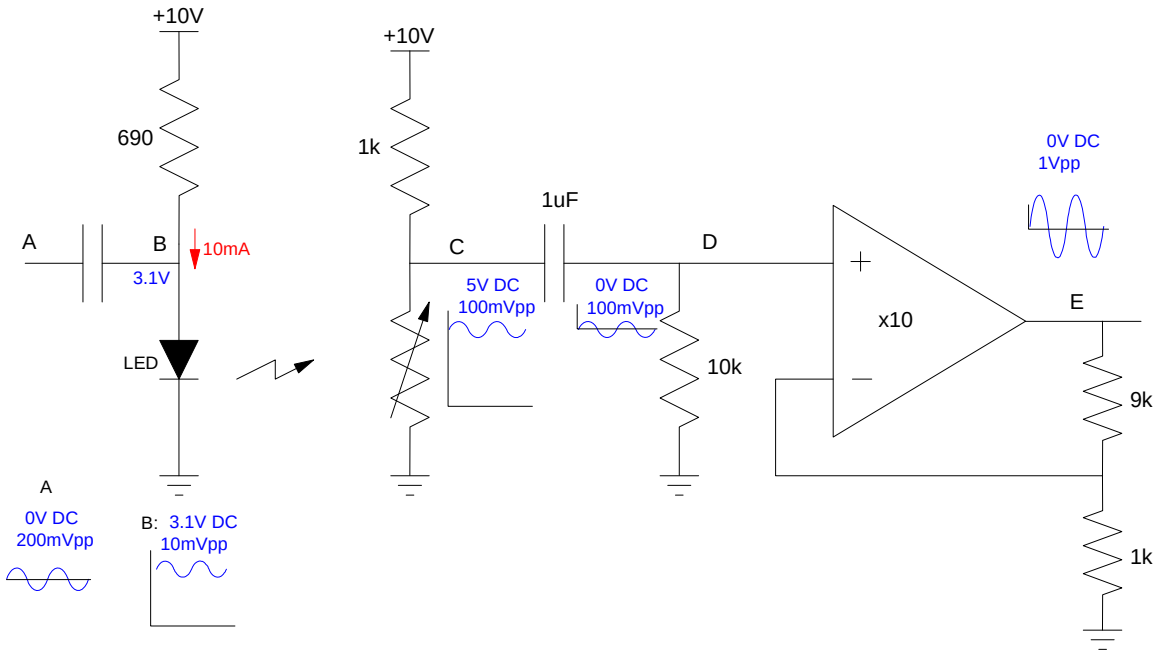
ECE 321 - Homework #2

The signals should look something like the following.



A) A 100mVp 1kHz sine wave

B) Ideally, VDC = 3.1V (the voltage across a diode is Vf), VAC = 0V. Actually, as the current varies, the voltage across the LED will vary slightly.

C) As the light varies, the resistance (and voltage) will vary. The level depends upon the distance to the light sensor, how well the light is aligned, etc.

- DC Signal: 5V (anything away from 0V and 10V is OK)
- AC Signal: 100mVpp (measure this)

D) Add a DC block. The voltage at D should be

$$V_D = \left(\frac{10k}{10k + \frac{1}{j\omega C}} \right) V_C$$

- DC Signal: 0V
- AC Signal: 100mVpp

E) Amplified signal (x10 here)

- DC Signal: 0V
- AC Signal: 1Vpp