ECE 321 Homework #5

Sound on a Light Beam. Due Friday, May 5th

1) LED Analysis: Assume the LED has the following characteristics
   - Vf = 3.3V @ 100mA
   - 1200 lux @ 20mA @ 3cm

a) Calculate the DC current through the LED.

b) Find the impedance of the 1uF capacitor at 1kHz

c) Compute the AC current through the LED assuming the input is 100mVpp at 1kHz.

d) Compute the Lux produced by the LED (DC and AC terms)

2) CdS Analysis: Assume the CdS light sensor has the characteristic

$$R = \frac{280,000}{Lux}$$

a) Determine the DC resistanec of the CdS light sensor

b) Determine the AC resistance of the CdS light sensor

c) Determine the voltage at point B (DC and AC term). Assyne the input is 1mVpp at 1kHz

3) Determine the gain of the non-inverting amplifier so that the output at pint D is 2Vpp at 1kHz

Bonus!: Build this circuit in lab and drive the filter - push pull amplifier from previous homework sets.

Collect data to verify your calculations for the LED and CdS sensor.