Name_____
Lab Partner(s):_____
Date Performed:_____
Date Due: March 11, 2014
Physics 111 Laboratory
Experiment #6
Photoelectric Effect

Attach your fully labeled and captioned data tables for each part along with any fully labeled and captioned graphical representations of your data that you may have created to the end of this handout.

Honor Code Statement:

1. What assumptions do you need to make to perform this experiment?

2. From your plot of V_{stop} vs. f for the different colors you measured, are your data consistent with this Einstein's model for the photoelectric effect? Explain.

3. From your average values of the stopping potentials for each color of light, what is the maximum value for the speed of the electron for each color of light?

4. From your plot of V_{stop} vs. f, what do the slopes of the lines tell you? What are your two experimental values of h. How close do your two measurements come to the accepted value for Planck's constant? Calculate the % difference for each. Then average your two results and calculate a % difference.

5. From your plot of V_{stop} vs. f, what do the intercepts of the lines represent? Based on your plot, what are the two values for the work function of the photodiode? Next, average these two values and calculate a % difference.

6. From your plot of V_{stop} vs. f, what are the minimum frequencies that will produce photoelectrons? What should be the minimum frequency?

7. From your plot of the stopping potential versus intensity of light transmitted for each color of light, what does your plot show? Based on the plot, do your results support the fact that light behaves as a wave or a particle. Be sure to fully explain your answer and show how your plot supports your choice.