Exam 3 Long Answer Options:

Pick up to 3 of these questions for up to 2 points each replacement credit on your exams (you will not be able to exceed 40 points total, but this can make up some of your points on the exam.. even if you already got a problem correct you can earn points)

For each of the problems that you select to answer. You must show your work.

BRING THIS SHEET IN: Due in class 11a (sharp!), Nov 29.

1. A certain color of light (EM radiation) has a wavelength of 600nm. What is its frequency? (show your work)

2. After combing my hair with a plastic comb, I find that small pieces of tissue paper will stick to the comb and to my hair. The tissue paper is attracted to both the comb and the hair from a distance. Describe the signs of charges on the comb and the hair? How do you know?

I am abiding the Honor Code:

'On my honor as a University of Colorado at Boulder student I have neither given nor received unauthorized assistance on this work.'

Signature _____

- **3.** I hook up a battery and a bulb with two wires as shown below. Which of the following statements are true? (Assume that the wires are real and have some small amount of resistance!) How do you know?
 - i. Current will not flow.
 - ii. The wires will heat up.
 - iii. The voltage at the (+) side of the battery is the same as the voltage at the base of the bulb.



Consider the following 5 arrangements of charges. When thinking about these arrangements, you should be sure you understand how Coulomb's Law works to tell you how the force the puck feels under each of the circumstances will differ.

4. List all the scenarios where the 'puck' feels the same magnitude of force, and why:

"Nailed down" Negative charges (white)		PUCK with Negative Charge!		"Nailed down" Positive charges (gray)	
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