Circuits Final Lab and Report

Physics

For this lab, your goal is to design and test several circuits in order to demonstrate your understanding of the following concepts:

1. *Circuit design, diagramming, and construction*
2. *Ohm's Law*
3. *Resistance in series, parallel, and mixed circuits*

Part 1: Parallel circuit

Draw a circuit that will power two blue LED's – one with a current of 15 mA and one with a current of 25 mA. **Your power supply should be set to 7.5 V**. You can assume that the resistance of the LED at 15 mA will be about 250 Ohms and the resistance of the LED at 25 mA will be about 150 Ohms. (Be careful – if your current exceeds 25 mA through an LED it can easily blow.)

After you've drawn up your circuit, build it and test the current through each LED. In your write up, below your drawing, explain any differences you saw between your predicted design and the actual current flow. If your actual current varies by more than 10% from your predicted current, you will need to find and correct any errors you made.

Part 2: Series and Parallel circuits

Draw a circuit that will power three blue LED's – one with a current of 25 mA, one with a current of 15 mA, and one with a current of 10 mA. **Your power supply should be set to 7.5 V**. The 10 and 15 mA LED's should be wired in parallel. The 25 mA LED should be wired in series with the parallel circuit. Assume the resistance of the 10 mA LED will be about 335 Ohms.

After you've drawn up your circuit, build it and test the current through each LED. As above, explain any differences between your predicted and observed currents.

Please Note:

Your write up for this lab will consist of your circuit diagrams, all your calculations for your predictions, a list of the actual components used (this can be appended to your circuit diagrams), your measured currents through each LED, and a discussion of the differences between your predictions and actual currents. You should hand-write or type the report and turn it in to the silver bin in class.