Lab 5 Worksheet   CM: _____

Names: _____ , _____

Table W1. Comparison of the numerical and experimental values for the weight position, L_{opt}, that minimizes the maximum angular velocity of the pendulum's residual swing.

L_{opt} (cm) by numerical simulation in Lab 4	Experimental L_{opt} (cm)

Questions:

Start a new Word document and type your answers to the following questions:

1. How do the numerical and experimental values for the optimal weight location, L_{opt}, in Table W1 compare?

2. Describe the similarities and differences between your plotted experimental data for the maximum angular velocity of the pendulum's residual swing as a function of the circular weight location, $L_{w,cg}$, and your numerical simulation results from Lab 4 for each move strategy.

3. What do you think is contributing to discrepancies in the results? Provide reasonable explanations. (Is air drag reasonable?)

Attach the following to this worksheet:

1. Two plots, one for each move strategy, illustrating how the maximum angular velocity of the pendulum's residual swing varies with the circular weight's location (in centimeters) along the rod, $L_{w,cg}$, for your experimental data and your numerical simulation results from Lab 4. Be sure to do the following:

    - Properly label your axes with units and use markers for the data points.

    - Use different markers for your experimental data and your numerical simulation results, and include a legend to clearly identify what each set of markers represents.

    - Include your initials and the date in the title of each figure, and remove the gray border around the figures.

    - Copy your plots into a single Word file by selecting **Edit → Copy Figure** in each figure window and pasting the plot into your Word file.

2. A printout of your Word document containing your answers to the questions asked in this worksheet.

3. A printout of your Excel data sheet that has been **signed and dated** at the bottom.

4. A completed Lab 4 worksheet with numerical simulation results (Table W1).

5. A printout of your Simulink model used for simulation in Lab 4.

6. A printout of your MATLAB m-file(s) used to run your simulation in Lab 4 and to plot the experimental data and numerical simulation results for each move strategy in the same figure for Lab 5.