PHYS 221 Moment of Inertia Prelab

- 1. What is the objective of this experiment? (1 pt.)
- 2. What is the moment of inertia? Explain using words only. (1 pt.)

3. Draw two force diagrams for the hanging mass in this experiment. One diagram for step #2 and another for step 3. (Be sure and draw to scale. 2 pts.)

- 4. Explain how frictional force is compensated for in this experiment. See step 2 (1 pt.).
- 5. How much torque is applied to the apparatus in the figure below? The apparatus consists of a mass tied to a string which is wound around the axle of wheel. The mass falls at a constant speed. See step 2. Use m = 5 g, and show all work. (1 pt.)



- 6. If the mass in question 6 drops for 90 cm and takes 20 seconds to fall, calculate the angular acceleration of the axle to which the string is attached; see the figure above. (You should not have to be reminded, but $y = 1/2 a_y t^2$ (2 pts.)
- 7. In question 6, the weight providing the tension drops at a rate of 0.07 m/s². Calculate the moment of inertia of the wheel. Use $\tau = I\alpha$. Use the torque from question 5. Show all work. 2 pts.)