Physics 230 Lab #12 – Torsion Pendulum

This lab is one of the easiest labs if this is not the one. If you can't finish this lab in 60 minutes, something is not right, and I mean it.

Prior to the lab

Locate where equipment is. Every station has its own locations for the rod. Also, there are two different types of locking mechanisms on discs – requires either a screw driver or an Allan wrench.

Actual lab

There is a rod support attach to the rack above each lab station. First attach the rod to the disc and suspend them from the support. When you do this, to protect the lab table, put a backpack (both physics and math books inside) or something tough enough to absorb the impact. If you don't protect the table, you will pay the price.

Twist the disc no more than 45^0 and start timing and counting. Measure the amount of time that takes 50 oscillations. When you write the amount of time as a datum, write as you read!

Repeat the above, but this time, put a ring onto the disc. Be careful when you lower the disc.

Measure masses and radii of the disc and the ring. You will have to use a heavy-duty triple beam to measure masses. When you do so, make sure that dampening fan is not touching the magnets (you will see some scrapes on the fan). For the ring, outer diameter is not difficult to measure, but you need to be careful when you try to measure inner radius – as a matter of fact, you can't measure the inner radius directly. So, think about how you can obtain the inner radius.

Analysis

Once they are measured, calculate the rotational inertia of the disc using two different methods. The error should be within 2%.