**Lecture Quiz 6, Physics 161, Spring 2003**
**Due, Monday, March 17, Beginning of Class**

**You can do this individually or in goups, maximum 3. If you do it in groups, you CAN hand in one solution per group or one solution per person all stapled together, as you wish.**

**Putting your name on work to which you didn't contribute is CHEATING. If I suspect that is the case, I will hold every single person in the group responsible.**

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**Q1** As shown in class, a magnet is placed on a vertical metallic disk. The disk is connected to a motor which when turned on, can rotate the disk with various angular speeds $\omega$. Note that now we are adding one more interaction to our list of forces, namely the magnetic attraction between the magnet and the metal. Let's call this $F_{mag}$.

a). Draw a complete free body diagram of the magnet. Make sure that the length of the force vectors you draw is indicative of the relative strength of the forces in each direction.

b). Now suppose we set the disk rotating. At the time when the disk is rotating with some constant angular velocity $\omega$ such that the magnet rotates without sliding relative to the disk, **draw a complete free body diagram of the magnet when its (i) at highest point on the circle and (ii) the lowest point on the circle.**. (Recall $\omega = \frac{v}{R}$),