PHYS 101
**Homework # 5**
DUE DATE: October 20, 2009

You have to use problem solving methods (analysis, solution and checks). Please do not submit copycat answers from the solutions book, internet or some other solution you have in hand. You should at least show your understanding of the problem. Otherwise, this will be considered as cheating.

1) A penny of mass 3.10 g rests on a small 20.0-g block supported by a spinning disk. The coefficients of friction between block and disk are 0.750 (static) and 0.640 (kinetic) while those for the penny and block are 0.520 (static) and 0.450 (kinetic). What is the maximum rate of rotation in revolutions per minute that the disk can have, without the block or penny sliding on the disk?
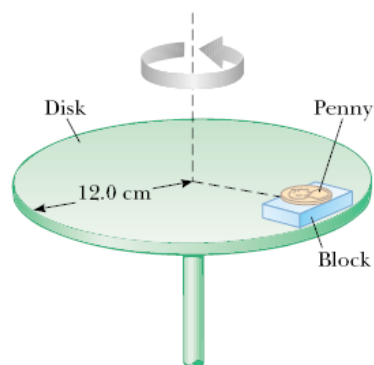
2) Discussion Questions 5.4, 5.16, 5.19, 5.32   in the text. Chapter 5. Page 166-167.

3) Problem 5-76   in the text. Chapter 5.

4) Problem 5-91   in the text. Chapter 5.

5) Problem 5-102 in the text. Chapter 5.

6) A single bead can slide with negligible friction on a wire that is bent into a circular loop of radius 15.0 cm. The circle is always in a vertical plane and rotates steadily about its vertical diameter with (a) a period of 0.450 s. The position of the bead is described by the angle θ that the radial line, from the center of the loop to the bead, makes with the vertical. At what angle up from the bottom of the circle can the bead stay motionless relative to the turning circle? (b) **What If?** Repeat the problem if the period of the circle's rotation is 0.850 s.