2425 Quiz for Chapters 10 – 13. Spring 2009

Name: **Section:**

1. As a platter with diameter 0.350 m and mass 400 g is rotating with angular speed of 6.00 rad/s, you put a metal bar on it so they move with common angular speed of 4.00 rad/s. Ignore all the friction, please calculate the moment of inertia of the metal bar. If the bar's length is 0.300 m, can you tell me the mass of the bar?

2. When a ceiling fan rotating with an angular speed of 5.60 rad/s is turned off, a frictional torque of 0.15 N·m slows it to a stop in 25.0 s. What is the moment of inertia of the fan?

3. A child exerts a tangential 40.0-N force on the rim of a merry-go-round with a radius of 2.40 m. Please calculate its torque. If the merry-go-round' moment of inertia is 800 kg m^2, what is its angular acceleration? What is its mass?

4. In one hand you hold a 0.15-kg apple, in the other hand a 0.20-kg orange. They are separated by 0.80 m. What is the magnitude of the force of gravity that **(a)** the orange exerts on the apple and **(b)** the apple exerts on the orange?

5. (a) Calculate the potential energy of a 10.0-kg mass on the surface of the Earth and at an altitude of 700 km respectively; (b) calculate the speed needed to move this mass from surface of the Earth to the altitude of 700 km.

6. A 0.50-kg mass attached to a spring undergoes simple harmonic motion with a period of 1.50 s. What is the force constant of the spring?

7. After landing on an unfamiliar planet, a space explorer constructs a simple pendulum of length 60.0 cm. The explorer finds that the pendulum completes 60.0 full swing cycles in a time of 120 s. What is the value of the acceleration of gravity on this planet?

8. The period of small oscillations of a physical pendulum is 4 s on Earth and 9 s on Planet X. What is the acceleration of gravity on Planet X?

9. Someone holds a horizontal meter stick of weight *w* with his thumb pushing down at the 10 cm line and his fingers pushing up at the 25 cm line. What are the applied forces of the thumb and of the fingers?