Study Guide (for final Exam)

1. Everything listed in the previous study guides for the midterms
2. Rotational motion
    A. Handling real objects.
        1. Mass of center. Definition, how to find mass of center?
        2. Moment of inertia: Definition, units, How to find moment of inertia, Parallel axis theorem
    B. equilibrium:
        Equilibrium condition: BOTH total force and total torque are zero.
    C. Rotational motion.
        1. Definition of the quantities:
            Torques, angular position, angular velocity, angular acceleration
            Rotational kinetic energy, angular momentum.
        2. What are their units? Are they vectors or scalars? If vectors, what are the directions?
        3. What are the relations between the angular and the linear variables?
        4. Newton's second law for rotation.
    D. translation and rotation:
        1. What is the difference of translation and rotation?
        2. Combination of the translation and rotation: rolling
        3. Energy and momentum in the rolling cases.
    E. Other topics associated with rotational motion
        1. What is the relation between torques and the angular momentum?
        2. Conservation of the angular momentum for the system with a changing rotational inertia, such as "people holds dumbbell", etc.
        3. Precession (wobbling) of a top and gyroscope.