

Caltech – Ph106a – Fall 2001

**Problem Set 7**

*due 12-5-2001*

This problem set will be scored slightly differently than usual. The eight problems carry 10 points each, but the maximum score will be 50. If you get higher than 50, the extra points will be counted the same as challenge problem points.

*I do not advise skipping the last three problems. Rigid body rotation will be examinable to the extent it is covered in lecture.*

1. H&F 6-17 (Hamilton-Jacobi for SHM).
2. (rolling cone + sphere)
  - (a) H&F 7-3.
  - (b) H&F 7-4. Is the constraint on  $\vec{V}_{cm}$  and  $\vec{\omega}$  holonomic?
3. (NMR) H&F 7-5.
4. (Artillery fire) H&F 7-11.
5. (Foucault pendulum) H&F 7-16.
6. (Euler eqns with torque) H&F 8-14.
7. (Gyroscope) H&F 8-18.
8. (Tippe top) H&F 8-20.