Study Guide: Ch. 1, Inertia, Weight and Forces

Answer the following questions and study the following topics to prepare for the upcoming multiple choice quiz. Note you must know all relevant units.

1) What is mass? How is it related to inertia?

2) What is weight? How is it related to mass?

3) How does the weight of an astronaut on the Moon compare to his weight on the Earth? How will his mass compare?

4) What is the weight of a 60kg person? Use the approximation from class.

5) Two forces act on a ball. One pushes to the left with a magnitude of 100N. The other pushes to the right with a magnitude of 60N. What is the net force acting on the ball?

6) What must be the net force acting on a body that is in mechanical equilibrium? Is a book sitting on a table in mechanical equilibrium?

7) A car drives along a straight highway at a constant speed of 65mph. Is the car in mechanical equilibrium?

8) Suppose you push against a heavy box with a force of 100N. What is the friction force acting on the box if it doesn’t move? What if the box moves along a straight line at a constant speed? What if the box speeds up?

9) An airplane cruises along a straight line path at a constant speed of 1000km/h. The thrusting force from its engines is a constant 10,000N. The only other force acting on the plane is the force due to air friction (drag) acting on the plane. What is the magnitude of this drag force?

10) What are units for mass? What are units for weight? What are the units for force?