Total time: 1 hr **Total Points: 10 pt** **Student Name:**

Answer the questions in the spaces provided on the question sheets. If you run out of room for an answer, continue on the back of the page.

$$\text{speed} = \frac{\text{distance}}{\text{time}} \qquad \text{velocity} = \frac{\text{displacement}}{\text{time}} \qquad \text{acceleration} = \frac{\text{change in velocity}}{\text{time}}$$

$g = 9.8\ \text{m/s}^2$ $F = ma$ $F_g = mg$ $F_{fr} = \mu F_N$ Torque = Force $\times$ Lever Arm

1. The coefficient of static friction for steel on steel is 0.58. If the normal force is 60 N, what is the maximum static friction you can have?
2. If the kinetic friction is 30 N and the normal friction is 100 N, what is the kinetic coefficient of friction?
3. An earthmover slows from 15.0 km/h to 3.00 km/h in 2.70 s. What is its rate of deceleration?
4. A rocket accelerates at 10.0 $\frac{\text{m}}{\text{s}^2}$ from rest for 20.0 s. Find its increase in speed?
5. Find the weight of a 1150-kg automobile in N?
6. What is the mass of a 20,000-N truck?
7. Find the acceleration produced by a total force of 93.0 N on a mass of 6.00 kg
8. Find the total force necessary to give each an object with mass 15.0 kg an acceleration of 2.00 $\frac{\text{m}}{\text{s}^2}$.
9. Find the total force necessary to give an automobile of mass 120 slugs an acceleration of 11.0 ft/s^2.
10. A truck of mass 13,100 kg is acted upon by a driving force of 8900 N. The motion is opposed by a frictional force of 2230 N. Find the acceleration
11. A force of 20.0 N is applied at a distance of 0.3 m, what is the torque N.m?
12. If you apply 35.0 lb force at a distance of 0.5 ft, what is the torque in ft.lb?
13. If the torque on a shaft of radius 2.37 cm is 38.0 N.m, what force is applied to the shaft?