Engineering Physics I – Fall 2015
Quiz 8 – November 12, 2015
Name: SOLUTIONS

1. True or false An example of an inelastic collision is two balls colliding and continuing with a common velocity.

This is an example of a completely inelastic collision.

2. True or False The momentum of a system of particles can be described by the momentum of their center of mass

In class we derived the expression $\mathbf{P}_{total} = M_{total}\mathbf{V}_{cm}$, which tells us that we can approximate the motion of a system of particles by the motion of its center of mass.

3. True or False Moment of inertia is a measure of the potential energy of rotation

The moment of inertia provides a way to measure the kinetic energy of rotation:
$KE_{rotational} = \frac{1}{2} I \omega^2$

4. True or False An object's moment of inertia depends only on its mass

The moment of inertia can be calculated by $I = \Sigma m_i r_i^2$
It depends on the total mass but also the distribution of mass (r_i, or how far the mass is from the axis of rotation) and the axis of rotation. For example, the moment of inertia for a rod with mass M and length L depends on whether the cylinder is rotating around an axis at one end point ($^1/_3 M L^2$) or the center ($^1/_{12} M L^2$).

5. True or False A given object can have more than one moment of inertia

See above