

4. Quiz

Some questions might have more than one correct answer.

- The center of mass of any object is
 - inside the object
 - on the surface of the object
 - the average position of particles in the object
 - at the most massive particle in the object
 - none of the above
- The center of mass of any solid object is:
 - located at the geometric center
 - located halfway between the geometric center and the nearest point on the surface
 - located away from the geometric center
 - located outside the object
 - not necessarily at any of the above places
- If we consider any imaginary plane through the center of mass of any object
 - there is just as much volume of the object on one side of the plane as on the other side
 - there is just as much surface area of the object on one side of the plane as on the other side
 - there are just as many particles on one side of the plane as on the other side
 - there is just as much mass on one side of the plane as on the other side
 - none of the above are true
- The center of mass of an object obeys an equation like the Newton's second law equation, where the mass in the equation is
 - the average mass of a particle in the object
 - the mass of the most massive particle in the object
 - the mass of the least massive particle in the object
 - the average of the least and most massive particles in the object
 - the total mass of the object
- The center of mass of an object obeys an equation like the Newton's second law equation, where the force in the equation is
 - the average force of particles in the object on other particles in the object
 - the net force of particles in the object on other particles in the object
 - the average force of particles outside the object on particles in the object
 - the net force of particles outside the object on particles in the object
 - none of the above
- The product of the total mass of an object and the velocity of its center of mass is
 - the total translational momentum of the object
 - the net force on the object
 - the average translational momentum of particles in the object
 - the average external force on the object
 - the acceleration of the object

7. If the net external force on a system of particles is zero:
- A. the center of mass does not move
 - B. the velocity of the center of mass does not change
 - C. the momentum of the system is zero
 - D. the momentum of the system does not change
 - E. the acceleration of the center of mass does not change
8. The center of mass of a system remains stationary
- A. always
 - B. never
 - C. whenever the net external force is zero
 - D. whenever friction is not present
 - E. if it is initially stationary and the net external force is zero
9. The center of mass of a system of particles
- A. cannot be faster than the fastest particle in the system
 - B. cannot be faster than the slowest particle in the system
 - C. cannot be slower than the fastest particle in the system
 - D. cannot be slower than the slowest particle in the system
 - E. must be faster than the fastest particle in the system
10. A system is composed of four identical particles. Three of them are at rest and the fourth has velocity \vec{v} . The velocity of the center of mass is
- A. zero
 - B. \vec{v}
 - C. $\vec{v}/3$
 - D. $\vec{v}/4$
 - E. $4\vec{v}$

Answers: (1) E; (2) E; (3) D; (4)E; (5) D; (6) A; (7) B, D, E; (8) E; (9) A, D; (10) D