

Fluid Mechanics

Section Quiz: Fluids and Buoyant Force

Write the letter of the correct answer in the space provided.

- _____ 1. Which of the following is a fluid at room temperature?
- oil
 - wood
 - lead
 - aluminum
- _____ 2. Which of the following statements is correct?
- Liquids have a definite shape.
 - Gases have a definite volume.
 - Gases have a definite shape.
 - Liquids have a definite volume.
- _____ 3. What is true about the volume of displaced fluid for an object that is completely submerged?
- The volume of displaced fluid is equal to the object's volume.
 - The volume of displaced fluid is less than the object's volume.
 - The volume of displaced fluid is greater than the object's volume.
 - The volume of displaced fluid is not related to the object's volume.
- _____ 4. If an object weighing 50.0 N displaces a volume of water with a weight of 10.0 N, what is the buoyant force on the object?
- 60.0 N
 - 50.0 N
 - 40.0 N
 - 10.0 N
- _____ 5. Which of the following statements is true about the buoyant force on an object that is floating on the surface of a lake?
- The buoyant force is greater than the weight of the object.
 - The buoyant force is equal to the weight of the fluid displaced.
 - The buoyant force is the same as when the object is completely submerged.
 - The buoyant force is less than the density of the water.
- _____ 6. In which of the following situations will an object sink?
- The mass density of the object is less than the mass density of the fluid.
 - The buoyant force on the object is equal to the weight of the object.
 - The mass density of the fluid is less than the mass density of the object.
 - The weight of the fluid displaced equals the weight of the object.

Fluid Mechanics *continued*

- _____ 7. An uncooked egg sinks in fresh water but floats in salt water. Which of the following expressions about the egg's density (ρ_{egg}) with respect to the density of fresh water (ρ_{fw}) and the density of salt water (ρ_{sw}) is correct?
- a. $\rho_{egg} < \rho_{fw} < \rho_{sw}$
 - b. $\rho_{sw} < \rho_{egg} < \rho_{fw}$
 - c. $\rho_{fw} < \rho_{egg} < \rho_{sw}$
 - d. $\rho_{fw} < \rho_{sw} < \rho_{egg}$

- _____ 8. Which statement about an object placed in water is correct?
- a. The apparent weight is always less than the weight of the object in air.
 - b. The apparent weight is always equal to the weight of the fluid displaced.
 - c. The apparent weight is never equal to zero.
 - d. The apparent weight is never greater than the buoyant force.

9. Explain why water as ice is not a fluid but water as a liquid or steam is a fluid.

10. Calculate the buoyant force on a cube of metal with an edge of 1.3 cm that is placed in salt water. The density of the metal is $7.86 \times 10^3 \text{ kg/m}^3$, and the density of the salt water is $1.025 \times 10^3 \text{ kg/m}^3$.