

# 1 Physics Quiz Questions on Buoyancy 12B

(1) 1

MULTIPLE CHOICE marked out of 1.0 penalty 0 One answer only Shuffle

A cube with a volume of  $2 \text{ m}^3$  is submerged in water. If the density of water is  $1000 \text{ kg/m}^3$ , what is the buoyant force acting on the cube?

- a. 1000 N
- b. 2000 N
- c. 5000 N
- d. 20000 N ✓

(2) 2

MULTIPLE CHOICE marked out of 1.0 penalty 0 One answer only Shuffle

How does the density of a fluid affect the buoyant force on an object submerged in it?

- a. Buoyant force decreases with increasing fluid density
- b. Buoyant force increases with increasing fluid density ✓
- c. Buoyant force is independent of fluid density
- d. Buoyant force is inversely proportional to fluid density

(3) 3

MULTIPLE CHOICE marked out of 1.0 penalty 0 One answer only Shuffle

A hydraulic lift operates based on which principle?

- a. Archimedes' Principle
- b. Bernoulli's Principle
- c. Pascal's Principle ✓
- d. Newton's First Law

(4) 4

MULTIPLE CHOICE marked out of 1.0 penalty 0 One answer only Shuffle

If two objects have the same mass but different volumes, which one will experience a greater buoyant force when submerged in water?

- a. The object with the larger volume ✓

- b. Both experience the same buoyant force
- c. It depends on the shape of the objects
- d. The object with the smaller volume

(5) 5

NUMERICAL marked out of 1.0 penalty 0

A rectangular pool is 8.0 m long, 4.0 m wide, and 2.0 m high and contains kerosene with density 820 kg/m<sup>3</sup> to a depth of 1.5 m high. What is the hydrostatic force on the bottom? ( $P_{atm} = 1.01 \times 10^5$ ,  $g = 9.8 \text{ m/s}^2$ )

- 3600000  $\pm$  100 (0%)

(6) 6

NUMERICAL marked out of 1.0 penalty 0

A cylinder with a radius of 5.0 cm contains 15 cm of water (1000 kg/m<sup>3</sup>). Gasoline (760 kg/m<sup>3</sup>) is then poured on top until the total depth of the liquid is 45 cm. What is the gauge pressure at the bottom of the cylinder ( $g = 9.8 \text{ m/s}^2$ )

- 3700  $\pm$  10 ✓

(7) 7

MULTIPLE CHOICE marked out of 1.0 penalty 0 One answer only Shuffle

A perpendicular force is applied to a certain area and produces a pressure P. If the same force is applied to a twice bigger area, the new pressure on the surface is:

- a. 2P ✓
- b. P
- c. P/2
- d. 4P
- e. P/4

(8) 8

MULTIPLE CHOICE marked out of 1.0 penalty 0 One answer only Shuffle

A boy swims a lake and initially dives 0.5 m beneath the surface. When he dives 1 m beneath the surface, how does the absolute pressure change?

- a. It doubles
- b. It quadruples
- c. It is cut to a half
- d. It slightly increases ✓
- e. It slightly decreases

(9) 9

MULTIPLE CHOICE marked out of 1.0 penalty 0 One answer only Shuffle

Three blocks of equal volume are completely submerged into water. The blocks made of different materials: aluminum, iron and lead. Which of the following is the correct statement about the buoyant force on each block? ( $\rho_{aluminum} = 2700 \text{ kg/m}^3$ ,  $\rho_{iron} = 7800 \text{ kg/m}^3$ ,  $\rho_{lead} = 11300 \text{ kg/m}^3$ )

- a.  $F_{aluminum} > F_{iron} > F_{lead}$
- b.  $F_{aluminum} < F_{iron} < F_{lead}$
- c.  $F_{aluminum} < F_{iron} > F_{lead}$
- d.  $F_{aluminum} = F_{iron} = F_{lead}$  ✓
- e.  $F_{aluminum} > F_{iron} < F_{lead}$

(10) 10

MULTIPLE CHOICE marked out of 1.0 penalty 0 One answer only Shuffle

An object has a weight of 9 N when it is in air and 7.2 N when it is submerged into water. What is the specific gravity of the object's material?

- a. 5 ✓
- b. 6
- c. 7
- d. 8
- e. 9

Total of marks: 10