

1 Physics Quiz Questions on Buoyancy 12A

(1) 1

MULTIPLE CHOICE

marked out of 1.0

penalty 0

One answer only

Shuffle

Day to day Atmospheric pressure varies. A floating ship will be on a low pressure day, compared to a high-pressure day.

- a. higher
- b. lower
- c. no different on a low-pressure day ✓

(2) 2

MULTIPLE CHOICE

marked out of 1.0

penalty 0

One answer only

Shuffle

The density of Silver is greater than that of Copper. If you had objects of Copper and Silver of the same dimensions and placed them in water... Would the buoyant force (F_b)

- a. be greater on Silver than Copper
- b. be smaller on Silver than Copper
- c. equal for Silver and Copper ✓

(3) 3

MULTIPLE CHOICE

marked out of 1.0

penalty 0

One answer only

Shuffle

A submarine with mass m rests on the sea bottom. The normal force exerted up on the sub by the sea-floor is equal to:

- a. Mg
- b. $\rho_w g V_w$
- c. $mg + \rho_w g V_w$
- d. $mg - \rho_w g V_w$ ✓
- e. $\rho_w g V_w - 1 \text{ atm}$

(4) 4

MULTIPLE CHOICE

marked out of 1.0

penalty 0

One answer only

Shuffle

A spherical inflated balloon is submerged in a pool of water. If it is further inflated so that its radius doubles, how is the buoyant force affected? ($V_{\text{sphere}} = \frac{4}{3}\pi r^3$)

- a. not at all
- b. 2 times larger
- c. 4 times larger
- d. 6 times larger
- e. 8 times larger ✓

(5) 5

NUMERICAL marked out of 1.0 penalty 0

A weather balloon (with a spherical shape) is filled with helium until its radius is 3.00 m. Its total mass including instruments is 20.0 kg. What is the F_{net} when the ball is released?

- 1004 ± 2 ✓

(6) 6

NUMERICAL marked out of 1.0 penalty 0

A 2.00 kg brass block is attached to a string and submerged under water. Find the buoyant force and the tension in the rope in Newtons (just put the number with no units). ($\rho_w = 1000 \text{ kg/m}^3$)

- 17.3 ± 0.5 ✓

(7) 7

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

What is the definition of density in terms of mass and volume?

- a. Density is the ratio of mass to volume. ✓
- b. Density is the product of mass and volume.
- c. Density is the difference between mass and volume.
- d. Density is the sum of mass and volume.

(8) 8

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

Which principle explains why ships float?

- a. Archimedes' principle ✓
- b. Bernoulli's principle
- c. Pascal's principle

d. Newton's third law

(9) **9**

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

How does the buoyant force on an object change if it is fully submerged in a fluid compared to when it is partially submerged?

- a. The buoyant force decreases when fully submerged.
- b. The buoyant force increases when fully submerged. ✓
- c. The buoyant force remains the same regardless of submersion.
- d. The buoyant force fluctuates with the object's shape.

(10) **10**

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

In a hydraulic system, if a small force is applied to a small piston, what happens to the force on a larger piston?

- a. The force on the larger piston remains the same.
- b. The force on the larger piston increases. ✓
- c. The force on the larger piston fluctuates randomly.
- d. The force on the larger piston decreases.

Total of marks: 10