1 Physics Quiz Questions on Buoyancy 12B

(1) **1**



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

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

(2) **2**



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 \checkmark
- c. Buoyant force is independent of fluid density
- d. Buoyant force is inversely proportional to fluid density

(3) **3**



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**

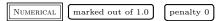


If two objects have the same mass but different volumes, which one will experience a greater buoyant force when submerged in water?

a. The object with the larger volume \checkmark

- 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**



A rectangular pool is 8.0 m long, 4.0 m wide, and 2.0 m high and contains kerosene with density 820 kg/m3 to a depth of 1.5 m high. What is the hydrostatic force on the bottom?($P_{atm} = 1.01 \times 10^5$, $g = 9.8m/s^2$)

• $3600000 \pm 100 \ (0\%)$

(6) **6**



A cylinder with a radius of 5.0 cm contains 15 cm of water (1000 kg/m3). Gasoline (760 kg/m3) 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 $(g = 9.8m/s^2)$

• $3700 \pm 10 \checkmark$

(7) **7**



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



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 \checkmark
- e. It slightly decreases

(9) **9**



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? ($\rho_{aluminum} = 2700 \text{ kg/m3}$, $\rho_{iron} = 7800 \text{ kg/m3}$, $\rho_{lead} = 11300 \text{ kg/m3}$)

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

(10) **10**



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