

1. In what direction does the buoyant force on an object immersed in a liquid act?

Ans. Vertically upward.

2. Why does a block of plastic released under water come up to the surface of water?

Ans. A block of plastic released under water does not come up to the surface of water because the upthrust or the buoyant force exerted by the water is greater than the downward gravitational force.

3. The volume of 50 g of a substance is 20 cm³. If the density of water is 1 g cm³, will the substance float or sink?

Ans. Volume of the substance = 20 cm³

Mass of the substance = 50 g.

$$\text{Density of the body} = \frac{\text{Mass}}{\text{Volume}} = \frac{50}{20} = 2.5 \text{ g/cm}^3$$

Density of the liquid = 1 g/cm³

Density of substance > density of liquid. So, the substance will sink.

4. The volume of a 500 g sealed packet is 350 cm³. Will the packet float or sink in water if the density of water is 1 g cm³? What will be the mass of the water displaced by this packet?

Ans. $m = 500 \text{ g}$

$V = 350 \text{ cm}^3$

$$\text{Density} = \frac{m}{V} = \frac{500}{350} = \frac{50}{35} = \frac{10}{7} \text{ g/cm}^3$$

The packet will sink because its density is more than water.

Weight of H₂O displacement = Vdg

$$mg = Vdg$$

$$m = 350 \times 1 = 350 \text{ g}$$