WORKSHEET 2

CHAPTER 4 – FLOATATION

A. Tick (✓) the correct option.

1. Thrust per unit area is called
   a. Buoyancy. b. Pressure. c. Thrust. d. none of these.
2. SI unit of pressure is
   a. Newton. b. kg/m^3. c. Pascal. d. none of these.
3. Pressure exerted by a force of 20 N on an area of 4 m^2 is
   a. 5 N. b. 10 N. c. 20 N. d. 0 N.
4. Density of a substance is inversely proportional to its
   a. mass. b. volume. c. thrust. d. none of these.
5. Buoyant force is inversely proportional to the
   a. density of fluid. b. gravity. c. temperature. d. none of these.

B. Fill in the blanks.

1. Density of a substance is defined as its mass per unit _____
2. Relative density of water is _____
3. If relative density of a substance is more than one, the substance will _____ in water.
4. The force acting on an object perpendicular to the surface is called _____
5. Density of an object of mass 40 g and volume 20 cm^3 is _____

C. State whether the given statements are true or false.

1. Relative density is a pure ratio of two similar quantities, it has no units.
2. When the weight of body is greater than the buoyant force, then the body will float.
3. Pressure inside a liquid increases with depth.
4. Not every liquid exerts an upward force, on the objects immersed in it.
5. Whenever any pressure is applied anywhere on a confined fluid, it is transmitted equally in all the directions throughout the fluid.

D. Match the following.

1. Pressure — $\frac{\text{Mass of substance}}{\text{Mass of equal volume of water}}$
2. Relative density — $\frac{\text{Mass}}{\text{Volume}}$
3. Density — $\frac{\text{Thrust}}{\text{Area}}$
4. Pressure exerted by liquid — $\text{Height of liquid} \times \text{Density of liquid} \times \text{Acceleration due to gravity}$

Name: ..... Teacher's signature: .....

Class: IX Date: .....

E. Answer the following questions.

Very Short Answer Questions

1. Define buoyancy.
2. Give the SI unit of density.

Short Answer Questions

1. An object of mass 100 g has density 5 g/cm^3. Find the volume of the object.
2. What will happen if the weight of the body is less than the buoyant force?

Long Answer Questions

1. Why do skiers use long flat skis to slide over snow?
2. The volume of 100 g of substance is 40 cm^3. If density of water is 1 g/cm^3, will the substance float or sink?

ANSWERS

WORKSHEET 2

A. Tick (✓) the correct option.

1. b 2. c 3. a 4. b 5. c

B. Fill in the blanks.

1. volume
2. one (1)
3. sink
4. thrust
5. 2 g/cm^3

C. State whether the given statements are true or false.

1. T 2. F 3. T 4. F 5. T

D. Match the following.

1. Pressure — $\frac{\text{Thrust}}{\text{Area}}$
2. Relative density — $\frac{\text{Mass of substance}}{\text{Mass of equal volume of water}}$
3. Density — $\frac{\text{Mass}}{\text{Volume}}$
4. Pressure exerted by liquid — $\text{Height of liquid} \times \text{Density of liquid} \times \text{Acceleration due to gravity}$

E. Answer the following questions.

Very Short Answer Questions

1. The tendency of a fluid to exert an upward force on an object placed in it is called buoyancy.
2. kg/m^3

Short Answer Questions

1. $\text{Density} = \frac{\text{Mass}}{\text{Volume}}$

   $5\ g/cm^3 = \frac{100\ g}{\text{Volume}}$

   $\text{Volume} = \frac{100}{5} = 20\ cm^3$

2. When weight of the body is less than the buoyant force, then the body will float partially above the surface of the liquid.

Long Answer Questions

1. Due to the long flat skis, the area of contact is larger. This reduces the pressure ($P \propto \frac{1}{A}$) exerted by the skier on the snow; enabling the skier to slide over the snow without sinking.

2. Volume of substance = 40 cm^3

   Mass of the substance = 100 g

   Density of the substance = $\frac{\text{Mass}}{\text{Volume}}$

   $= \frac{100}{40} = 2.5\ g/cm^3$

   Density of water = 1 g/cm^3

   Thus, density of the substance is 2.5 g/cm^3. Since the density of the substance is much higher than the density of water (1 g/cm^3), the substance will sink in water.