SHIKSHA CLASSES

Sub. : Science **Answer Paper** **Marks : 20**

Std. : VIIIth - S.B. **3. Force and Pressure**

Q.1(A) : Choose the correct alternative 2

1) The SI unit of force is ……..

Ans : b) Newton

2) For a given object, the buoyant force in liquids of different density is ……... .

Ans : a) same

Q.1(B) : Solve any one of the following question 1

1) During dry weath while combing hair, sometimes we experience hair flying apart. Which type of force is responsible for this ?

Ans : electrostatic force.

2) What is the SI unit of pressure?

Ans : N/m^2

3) Force is which type of quanity ?

Ans : Force is a vector quantity.

Q.2(A) : Give reason (Any One) 2

1) A ship dips to a larger depth in freshwater as compared to marine water.

Ans : The density of marine water is more than the fresh water due to which the buoyant force on the ship in marine water is more than the fresh water. Hence, the ship dips to a larger depth in fresh water as compared to marine water.

2) Fruits can easily be cut with a sharp knife.

Ans : Since the sharp edged knife makes lesser contact with the fruits to be cut, thus the pressure exerted by it on the fruit is very large. Because of this large pressure, fruits are easily cut with a sharp knife.

Q.2(B): Solve any two of the following question. 4

1) A plastic cube is released in water. Will it sink or come to the surface of water? Why?

Ans : The plastic cube is going to float on the surface of water as its density is less than that of water.

2) Define atmospheric pressure.

Ans : The pressure created due to air is called the atmospheric pressure.

3) How much pressure do we carry on our heads? Why don't we feel it?

Ans : We carry atmospheric pressure of about 10^5 Pa on our heads. We don't feel it because this atmospheric pressure is balanced by the pressure created by the air and blood inside our body.

4) The density of a metal is 10.8×10^3 kg/m^3. Find the relative density of the metal.

Ans : **Given:** Density of metal = 10.8×10^3 kg/m3

We know, density of water = 1000 kg/m^3

Relative density of substance =Density of substance / Density of water

Relative density of substance = $10.8 \times 10^3/1000 = 10.8$

Q.3 : Solve any two of the following question. 6

1) Why does it happen? If a stationary bus suddenly speeds up, passengers are thrown in the backward direction.

Ans : If a stationary bus suddenly speeds up, passengers are thrown in the backward direction. This is because initially the whole body of a passenger inside the bus was in the state of rest. But, when the bus suddenly starts or speeds up, the lower half of the passenger's body comes in motion in the forward direction but the upper half still remains at rest due to inertia of rest. Hence, the passengers are thrown backward when a stationary bus suddenly speeds up.

2) Complete the following tables.

Mass (kg)	Volume(m^3)	Density (kg/m^3)
350	175	-
-	190	4

Density of Metal (kg/m^3)	Density of water (kg/m^3)	Relative Density
	10^3	5
8.5×10^3	10^3	-

Ans : Using the formula,

density = mass / volume:

Mass (kg)	Volume(m^3)	Density (kg/m^3)
350	175	2
760	190	4

Using the formula, relative density = density of a metal/density of water :

Density of Metal (kg/m^3)	Density of water (kg/m^3)	Relative Density
5×10^3	10^3	5
8.5×10^3	10^3	8.5

3) Why does it happen? The wall of a dam is broad at its base.

Ans : We know pressure of liquid increases with depth. So, the wall of a dam is made broader at its base so that it is able to withstand the heavy pressure exerted by the river water.

4) The volume of a plastic-covered sealed box is 350 cm^3 and the box has a mass 500 g. Will the box float on water or sink in water? What will be the mass of water displaced by the box?

Ans : $\rho(\text{box}) = \frac{500\text{g}}{350\ \text{cm}^3} = \frac{10}{7}\ \text{g/cm}^3$

It is greater than that of water.

Hence, the box will sink in water.

The volume of water displaced by the box (V) = the volume of the box = 350 cm^3

Now, density $(\rho) = \frac{\text{mass(m)}}{\text{volume(V)}}$

$\therefore \quad m = \rho V$

$\therefore$ The mass of water displaced by the box $= 1\ \text{g.cm}^{-3} \times 30\ \text{cm}^3 = 350\ \text{g}.$

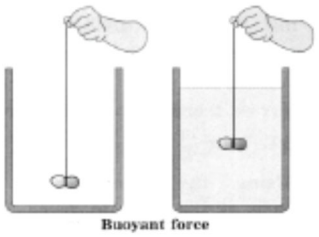
Q.4 : Solve any One of the following question. 5

1) Explain the Archemedes Principle.

Ans : Archimedes' principle: When an object is partially or fully immersed in a fluid, a force of buoyancy acts on it in the upward direction. This force is equal to the weight of the fluid displaced by the object.

Take a long rubberband and cut it at one point. At one of its ends tie a clean washed stone or 50 g weight as shown in Figure Now hold the other end of the rubberband and make a mark there. Keep the stone hanging in air and measure the length of the rubberband from the stone to the mark made earlier.

Now take water in a pot and hold the rubberband at such a height that the stone sinks in it. Again measure the length of the rubberband up to the mark. What is observed? This length is shorter than the earlier length. While dipping the stone in water, length of the stretched rubber gets slowly reduced and is minimum when it sinks completely.



When the stone is sunk in water, a buoyant force acts on it in the upward direction. The weight of the stone acts downwards. Therefore, the force which acts on it in the downward direction is effectively reduced.

2) a) Define Buoyant Force.On which factor the Buoyant force depend?

Ans : Buoyant Force: The upward force acting on the object in water or other fluid or gas is called the buoyant force.

The buoyant force depends upon the volume of the object immersed in the fluid (V), the density of the fluid (ρ 1) and the acceleration due to gravity (g) at that place.

b) How it is decided the object will float or sink in the liquid?

Ans : 1. The object floats if the buoyant force is larger than its weight.
2. The object sinks if the buoyant force is smaller than its weight.
3. The object floats inside the liquid if the buoyant force is equal to its weight.

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