

Chapter - 2.

Exploring forces:-

SHORT ANSWERS:-

① Q. ①, Refer page No. 2.2, 1.1

② Describe state of motion?

- Ans:-
- * If the body is in rest, the position does not change over time. Speed is zero; if sufficient force is applied then the body starts to move.
 - * If the body is in motion, the applied force can cause to increase its speed, resulting uniform motion or non-uniform motion.
 - * The applied force can be responsible for the change in direction.

③ what do you understand about the force of friction?
page No.:- 2.4, Note 4 points.

④ What is electrostatic force? why it is called non-contact?

Ans:-

- * A force of attraction & repulsion occurs between two charged bodies is known as "electrostatic force".
- * These charged bodies exert a force of attraction or repulsion without making any contact b/w them. Since there is

no contact b/w the bodies that are experiencing the force, we can call this electrostatic force as a 'non-contact force'.

⑤ We observe that the wheels of buses and trucks are heavier than the wheels of cars or scooter, why?

Ans:-

* Buses and Trucks carry massive loads of goods or many passengers

* These buses & trucks provide with heavier and wider wheels, because ~~they~~ these wheels will create a right amount of friction to move and stop safely.

* Since they are weighing more weight, these wheels are made ~~to provide~~ very strong, thicker rims & rubber in order to prevent them ^{from} wearing under extreme stress.

⑥ Find the weight of a 2.5 kg bag on Earth?

Sol:-

given Mass of bag $m = 2.5 \text{ kg}$

$$\text{Weight} = m \times g \text{ N.}$$

where g is acceleration due to gravity (10 m/s^2)

then we get-

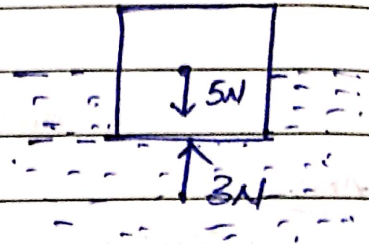
$$\text{Weight} = 2.5 \times 10 = \underline{\underline{25 \text{ N.}}}$$

- ⑦ A block weighs $5N$ in air and experiences $3N$ upthrust in water. Find its apparent weight in water, will it sink or float?

Ans.

Weight of block: $5N$

upthrust (exerted by water) = $3N$.



* Then apparent weight of the block still in water is $5N - 3N = \underline{2N}$.

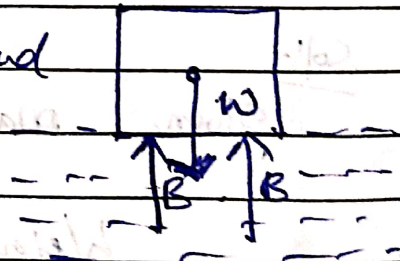
* Since weight of the block $5N$ is greater than the upthrust provided by the water $3N$. The block will sink.

- ⑧ Refer page no:- 2.8.

- ⑨ Write the condition for floating and sinking in terms of forces?

*

The weight of the body be W , and upward force exerted by water be " B ". (buoyant force).



* If $W > B$, the body will sink.

* If $W < B$, the body will float.

⑩ Differentiate the contact force and non-contact force?

Ans:

Contact force

Non-contact force

* These are the forces that apply to bodies when they come into direct contact with each other.

* Ex: frictional force, muscular, impact forces.

* There is no field associated with them.

* These are the forces that can affect the bodies without making any contact with them.

* Ex: gravitational, electrostatic, magnetic forces.

* The field always associated with non-contact forces.

Long Answers.

① Q.①. Refer page No: 2.3, 2.4, 2.5, 2.6, 2.7.

② Q.②. Refer page No: - 2.2, 2.3.

③ What is floating and sinking?

Ans:

floating and sinking of a object on and in a water respectively depends on some factors which are

1. weight of the object.
2. upthrust acting on the object by the water.
3. density of the object.
4. shape of the object.

* Archimedes principle says that the upthrust on an object equals the weight of the fluid displaced by the object.

* So if object is lighter compared to the fluid weight displaced by the object, then this object experience more upward thrust compared to its weight, so body will "float".

* If the object is denser or heavier compared to the fluid displaced by the object, then this body won't experience upward thrust that is enough to keep it float, hence object will get sink.

* For example Large ships made up of steel float because they are hollow and designed in a shape, that make its average density less than that of water and allowing it to displace more volume of water greater weight than its weight.

4. State and explain Archimedes' principle with an everyday example.

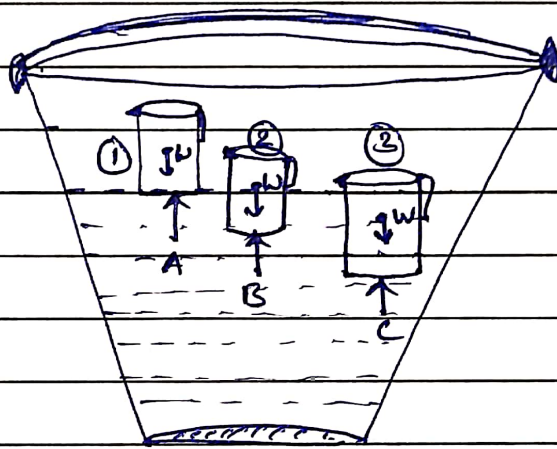
Ans: * Archimedes principle says "The buoyant force on an object is equal to the weight of the fluid displaced by it."

* Every object that placed on a liquid displaces some liquid. The liquid that displaced will be responsible for the upward thrust experiencing by that object.

* If the upward thrust is more than the weight of the object, the object will float and if the upward thrust is less than the weight of the object the object will sink.

* More it displaces the water (liquid) more the body will experience the upward thrust.

* Let us consider a day to day example.



→ Take one bucket full of water & mug. Consider three cases as shown in the figure.

* Case ①. The mug will displace some water, which will be responsible for the floating of the mug.

* Case ②. We push the mug into the water with some force. Now it will displace more water compared to the 1st case. Since it is displaced more weight of the water, more upward thrust it will experience. i.e. more buoyant force.

* Case ③. If we push further, the mug will displace more water, which is more than the weight of the mug, hence it will experience more buoyant force than the previous cases.

With this we can conclude as Archimedes principle says, buoyant force depends on the ^{weight} liquid weight of the liquid displaced by the object.

