

INTEXT QUESTION-ANSWERS

Questions

Q. 1. Is it always necessary that force make an object to move ?

Ans. No, it is not necessary that the force always make an object to move. Sometimes when a force is applied, there is no change in the state of object (rest or motion), but the force only tends to change the state of the object.

Q. 2. Can force only increase or decrease the speed of the object ?

Ans. The force can not only increase or

decrease the speed of the object but in addition it has the following other effects :

1. Can move an object from rest to motion.
2. Can stop a moving object.
3. It can also bring change in the direction of the moving object.
4. Can change the shape of the object.

Q. 3. When a plastic scale is rubbed with hairs and brought near bits of paper, they stick to the scale. Why ?

Ans. A plastic scale gets charged when it is rubbed with the hairs. This electrostatically

charged piece of plastic attracts uncharged bits of paper from a distance without making contact. This is a non-contact force.

Q. 4. Is gravitational force a universal force ?

Ans. When we release an object from our hands, that object falls down freely towards the earth, because the earth attracts the object towards itself due to its gravity. In fact, "every object with mass in this universe attracts every other object with mass". This force is called gravitational force because it acts on all objects in the universe, so it is universal force.

Q. 5. In which direction the force of Friction acts to the direction of motion of the objects ?

Ans. The frictional force acts in the direction opposite to the direction of motion of the object. That is, it opposes the speed of the object.

Questions

Q. 1. Pressure = $\frac{\text{Force}}{\text{Area}}$

$$\text{Ans. Pressure} = \frac{\text{Force}}{\text{Area}}$$

Q. 2. Show that liquid exerts equal pressure at same depth.

Ans. Take an empty tin and make three to four holes in it at the same depth and close them with cello tape. Fill the tin with water and remove all the cello tape. The water comes out of all the holes at the same speed and reaches the same distance. From this experiment it is proved that pressure is same at same depth.

Q. 3. What is atmosphere and atmospheric pressure ?

Ans. Atmosphere : Earth is surrounded by a 300 km thick layer of air. This blanket (envelope) of air surrounding the earth is called atmosphere.

Atmospheric Pressure : There is a 300 km layer of air around the earth, which is called the atmosphere. The air of this atmosphere exerts pressure on objects. This pressure is called Atmospheric Pressure.

TEXTBOOK EXERCISES (SOLVED)

(A) Fill in the Blanks

1. Pressure is per unit
2. Gravitation force is force.
3. South pole of a magnet north pole of another magnet.
4. To draw water from a well we have to at rope.
5. A charged body an uncharged body towards it.

Ans. 1. force, area, 2. non-contact,

3. attracts, 4. apply Force, 5. attracts.

(B) Write True (T) or False (F)

1. Liquid pressure is least at the bottom of the container.
2. Force of friction is a non-contact force.
3. North pole of the magnet repels the south pole of another magnet.
4. Gravitational force is a contact force.
5. Force can change the state of motion of the body.

Ans. 1. (F), 2. (F), 3. (F), 4. (F), 5. (T).

(C) Match Column 'A' with Column 'B'

| Column 'A' | Column 'B' |
|-------------------------|------------------------------------|
| 1. Pressure | (a) Pull or push |
| 2. Gravitational force | (b) Working of a dropper |
| 3. Atmospheric pressure | (c) Force/Area |
| 4. Force | (d) Opposes the motion of the body |
| 5. Friction force | (e) Non-contact force. |

Ans.

| Column 'A' | Column 'B' |
|-------------------------|------------------------------------|
| 1. Pressure | (c) Force/Area |
| 2. Gravitational force | (e) Non-contact force |
| 3. Atmospheric pressure | (b) Working of a dropper |
| 4. Force | (a) Pull or push |
| 5. Friction force | (d) Opposes the motion of the body |

Q. 1. What is force ?

Ans. Force : *The pull or push that moves an object from rest or stops the moving object or changes the direction of the object or changes the size of the object or tries to do this, is called force.*

Q. 2. What are contact forces ?

Ans. Contact Force : *When applied force is in direct contact with the object, then such force is called contact force. Forces exert their effect until the object remains in direct contact with the force. Example : When you kick a football, it moves. The football does not move until your foot makes contact with the football.*

Q. 3. What are non-contact forces ?

Ans. Non-Contact Force : *If the applied force is not in direct contact with the object, but is acting at some distance from the object and then such force is called Non-Contact Force.*

Example : Place a magnet near iron pins. The pins will be attracted to the magnet without any contact. Here the magnet is attracting the pins by exerting a non-contact force on the pins.

Q. 4. Give two examples each of contact forces and non contact forces ?**Ans. Examples of contact forces :**

1. **Muscular force :** The rickshaw puller pulls the rickshaw using his physical strength.

2. **Force of friction :** When the engine of a moving vehicle is turned off, the vehicle automatically stops after covering some distance. This happens due to the effect of frictional force between the tyres of the vehicle and the road.

Examples of non contact forces :

1. **Magnetic force :** When a magnet is placed at some distance from iron pins, the pins are attracted towards the magnet.

Here the magnet and the pins have no contact with each other.

2. **Gravitational force :** When we open the water tap, the water falls downward towards the earth due to the attraction of the earth. This is due to the gravity of the earth.

Q. 5. What is gravitational force ?

Ans. Gravitational Force : Every object with mass in this universe attracts another object with mass towards itself. This force is called Gravitational Force.

Example : 1. Water in rivers flows from higher to lower level. This is possible due to the force of gravity.

2. Tides in the sea water are due to gravitational force.

Q. 6. What is force of friction ?

Ans. Force of friction : When an object moves on the surface of another object, a force of friction comes into play which opposes the motion, because the force of friction is acting at the interface of the contact surfaces, So this is also an example of contact force.

Q. 7. What is electrostatic force ?

Ans. Electrostatic Force : The force exerted by a charged object on another charged or uncharged object is called electrostatic force. The electrostatic force is a non-contact force.

Q. 8. Can force change the direction of the motion of the body ?

Ans. A force can cause a change in the direction of a moving object. State of motion refers to the speed and to the direction of an object in which it is moving.

For example, in the game of cricket, the batsman flicks the thrown ball with the bat, due to which the batsman exerts force on the ball through the bat. This force can be increased or decreased which changes the direction of the motion of the ball. Therefore, apart from the change in the motion of the object, it can also change the direction of its motion.

Q. 9. Differentiate between contact and non-contact forces.

Ans. The contact force comes into play when the surfaces of two objects come into contact with each other.

The non-contact force comes into play when two objects exert a force at a distance from each other. Electrostatic force, magnetic force and gravitational force are examples of non-contact force.

Q. 10. What are types of forces ?

Ans. Types of Forces : There are two main types of forces :

1. **Contact Force :** It is classified into the following types :

(i) Muscular Force

(ii) Frictional force.

2. **Non-Contact Force :** It is classified into the following types :

(i) Magnetic force

(ii) Electrostatic force

(iii) Gravitational force.

Q. 11. Give an activity to show that air exerts pressure.

Ans. Air exerts Pressure :

Activity :

1. Take a rubber balloon. Inflate this balloon by filling it with air. Air exerts pressure on the walls of the balloon, due to which its size increases.

2. Now open the mouth of this inflated balloon. You will see that the balloon returns to its initial loose state. From this it is clear that there is air pressure.

Q. 12. What is pressure ?

Ans. Pressure-The force exerted on a unit area is called pressure.

i.e.

$$\text{Pressure} = \frac{\text{Force}}{\text{Area on which force is acting}}$$

The unit of pressure is Newton per square meter or Pascal. Pressure on an object is inversely proportional to its area. That is, the smaller the area, the greater the pressure.

Q. 13. What is atmosphere and atmospheric pressure ?

Ans. Refer to Q.3 Page No. 40

Q. 14. Why it is easier to cut the apple with knife of sharp edge than a blunt one ?

Ans. A sharpened knife provides less area for the force that we apply, due to which more pressure is exerted on the apple, resulting in an easier cut.

Q. 15. Why the tools meant for cutting and piercing always have sharp edges ?

Ans. We know

$$\text{Pressure} = \frac{\text{Force}}{\text{Area on which force is acting}}$$

$$\text{Pressure} = \frac{1}{\text{Area}}$$

In the above formula, the area is in the denominator, so the smaller the area when pressing on an object, the more pressure will be exerted on the object. The sharp edge of the cutting, slitting tools will have less area than the blunt edge, thus the pressure will increase. Due to this high pressure, the object will be cut or torn quickly and easily.

Q. 16 . Why it is easier to push a nail in the wood with pointed end than the head ?

Ans. The area of the sharp end of the nail is very less compared to its thick end, so the same force creates more pressure to drive the sharp end of the nail into the wood. As the pressure increases, it becomes easier to fix the nail.

Q. 17. Show with an activity that liquid pressure increases with depth.

Ans. Liquid pressure increases with depth ;

1. Take a plastic bottle and make three holes on one side of it at different heights as shown in the figure. Close these holes by using cork or tape them.

2. Now fill the bottle with water.

3. Open the three holes through which the water will come out. You will see that the water from the lowest hole is falling the farthest from the bottle. The water coming out from the highest hole at the top of the bottle is falling close to the bottle while the water in the middle hole falls between the two distances. This activity leads to the conclusion that the pressure exerted by a liquid depends

on the depth from the surface of the liquid.

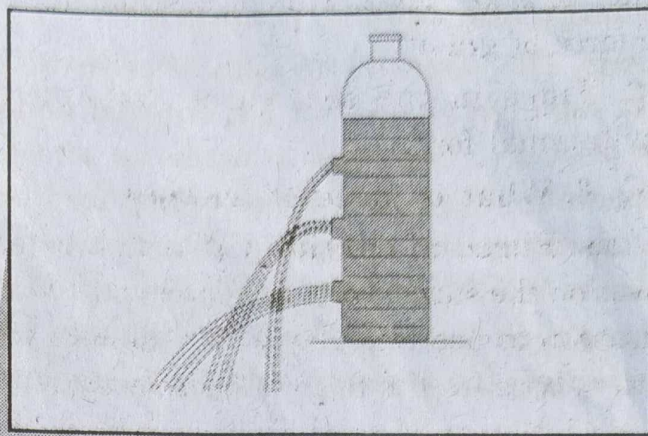


Fig. The pressure of the liquid increases with height of water column

Q. 18. Show with an activity that atmosphere exerts pressure.

Ans. Atmosphere Exerts Pressure : We can show this effect with the help of the following activity :

Activity. 1. Take a good quality rubber sucker. It looks like a small cup.

2. Press it firmly on a flat surface. You will see that it sticks to the surface because the air between the sucker and the surface has been expelled out and atmospheric pressure acts on the sucker.



Fig. A pressed rubber sucker stuck to the surface

3. Now pull it by applying a force greater than the atmospheric pressure so that the force overcomes the atmospheric pressure and it gets separated from the surface. You will realize that by applying a larger force you will be able to remove the sucker. This shows that the atmosphere exerts pressure.

Q. 19. Why are we not crushed under the huge atmosphere pressure ?

Ans. The value of atmospheric pressure is quite high, yet we do not get crushed under this pressure. Our body is made up of cells that contain fluids, which exert pressure from the inside to the outside of the body. The pressure inside our body is also equal to the atmospheric pressure and it balances (or neutralizes) the pressure outside. So we don't

get crushed even after a lot of atmospheric pressure.

Q. 20. Why walls of the dam always made thicker at the bottom ?

Ans. The pressure with in the fluid increases with depth. Therefore, as the depth increases, the pressure on the dam wall gradually increases. A thicker wall is required to withstand the increased pressure, so the walls of the dam always made thicker at the bottom.