Force and Pressure

Q.1 Give two examples each of situations in which you push or pull to change the state of motion of objects.

Sol: *Examples of Push:*

1. We close the door by pushing.
2. We push a wooden box to move it.

Examples of Pull:

1. Pulling a door for open.
2. A horse pulling the cart.

Q.2 Give two examples of situations in which applied force causes a change in the shape of an object.

Sol: Two examples of situation in which a force can change the shape of an object are:

1. Plastic bottles changes their shape when we squeeze it.
2. Squeezing of lemon by hand change its shape.

Q.3 Fill in the blanks in the following statements.

(a) To draw water from a well we have to ____ at the rope.
(b) A charged body _____ an uncharged body towards it.
(c) To move a loaded trolley, we have to _____ it.
(d) The north pole of a magnet _____ the north pole of another magnet.

Sol:

(a) To draw water from a well we have to **pull** at the rope.
(b) A charged body **attracts** an uncharged body towards it.
(c) To move a loaded trolley, we have to **push or pull** it.
(d) The north pole of a magnet **Repel** the north pole of another magnet.

Q.4 An archer stretches her bow while taking aim at the target. She then releases the arrow, which begins to move towards the target. Based on this information fill up the gaps in the following statements using the following terms. muscular, contact, non-contact, gravity, friction, shape, attraction

(a) To stretch the bow, the archer applies a force that causes a change in its_____.
(b) The force applied by the archer to stretch the bow is an example of _____ force.
(c) The type of force responsible for a change in the state of motion of the arrow is an example of a _____ force.
(d) While the arrow moves towards its target, the forces acting on it are due to _____ and that due to _____ of air.

Sol:

(a) To stretch the bow, the archer applies a force that causes a change in its **Shape**.
(b) The force applied by the archer to stretch the bow is an example of **Muscular** force.
(c) The type of force responsible for a change in the state of motion of the arrow is an example of a **contact** force.
(d) While the arrow moves towards its target, the forces acting on it are due to **gravity** and that due to **friction** of air.

Q.5 In the following situations identify the agent exerting the force and the object on which it acts. State the effect of the force in each case.

(a) Squeezing a piece of lemon between the fingers to extract its juice.
(b) Taking out paste from a toothpaste tube.
(c) A load suspended from a spring while its other end is on a hook fixed to a wall.
(d) An athlete making a high jump to clear the bar at a certain height.

Sol:

(a) When lemon is squeezed, force is applied by the hands on the lemon. Due to this, the shape of lemon gets changed.
(b) The force is applied by the hand on the toothpaste tube which changes of shape of the tube.
(c) The suspended load applied a downward force on the spring due to this, spring elongates.
(d) When an athlete takes a high jump, his feet applies force on the ground. Due to this, he jumps over the bar and his state of motion changes.

Q.6 A blacksmith hammers a hot piece of iron while making a tool. How does the force due to hammering affect the piece of iron?

Sol: A blacksmith hammers a hot piece of iron while making a tool. He applies a huge force on the iron which changes its shape for required tool.

Q.7 An inflated balloon was pressed against a wall after it has been rubbed with a piece of synthetic cloth. It was found that the balloon sticks to the wall. What force might be responsible for the attraction between the balloon and the wall?

Sol: When an inflated balloon is rubbed against a wall after it has been rubbed with a piece of synthetic cloth. After this activity, the balloon gets charged. A charged body can attract an uncharged body due to which the balloon sticks to the wall. The force between the charged balloon and uncharged wall is known as electrostatic force.

Q.8 Name the forces acting on a plastic bucket containing water held above ground level in your hand. Discuss why the forces acting on the bucket do not bring a change in its state of motion.

Sol: The forces working on the plastic bucket are muscular force applied by hand in upward direction and gravitation force in downward direction. Both the forces are equal magnitude and opposite to each other. Thus no change in state of motion is observed.

Q.9 A rocket has been fired upwards to launch a satellite in its orbit. Name the two forces acting on the rocket immediately after leaving the launching pad.

Sol: The forces acting on the rocket immediately after leaving the launching pad are the gravitation force or weight in downward direction and friction due to the air in downward direction.

Q.10 When we press the bulb of a dropper with its nozzle kept in water, air in the dropper is seen to escape in the form of bubbles. Once we release the pressure on the bulb, water gets filled in the dropper. The rise of water in the dropper is due to

(a) Pressure of water.
(b) Gravity of the earth.
(c) shape of rubber bulb
(d) atmospheric pressure

Sol: (d) atmospheric pressure