

# NCERT SOLUTIONS

## CLASS VIII SCIENCE

### CHAPTER-12 FRICTION

#### Question-1

Fill in the blanks with the appropriate words.

- It is the \_\_\_\_\_ of the surface on which the friction depends.
- Sliding friction is \_\_\_\_\_ compared to the static friction.
- \_\_\_\_\_ is produced by the friction.
- Friction opposes the \_\_\_\_\_ between the surface in contact with each other.
- The friction is \_\_\_\_\_ by the sprinkling of powder on the carom board.

#### Answer-

- It is the nature of the surface on which the friction depends.
- Sliding friction is lesser as comparative to the static friction.
- Heat is produced by the friction.
- Friction opposes the motion between the surfaces in contact with each other.
- The friction is reduced by the sprinkling of powder on the carom board.

#### Question-2

Among rolling, sliding and static friction, four children were asked to arrange forces, in a decreasing order. Look at the orders given below and choose the correct one.

- Static, Sliding, Rolling
- Rolling, Static, Sliding
- Sliding, Static, Rolling
- Rolling, Sliding, Static

#### Answer-

- Static, Sliding, Rolling

When the irregularities present in the surfaces of two objects in contact get interlocked with each other, friction comes into play. When we try to move an object which is at rest, static friction comes into play. When an object slides over the surface of another object, sliding friction comes into play. In this friction, the time given for interlocking is very small. Hence, interlocking is not strong. Therefore, a lesser force is required to overcome this interlocking. And because of this reason, sliding friction is less than static friction. Similarly, the area of contact in case of rolling friction is smallest as compared to static or sliding friction. Because of rolling, the area of contact changes gradually. Hence, rolling friction is lesser than both static and sliding friction. Thus, the correct sequence of frictions is static, sliding and rolling.

#### Question-3

There are four different surfaces namely, dry marble floor, wet marble floor, newspaper and towel spread on the floor. Kanika runs her toy car on all the four surfaces. On the basis of the given information, arrange the following force in increasing order of friction acting on the car on different surfaces.

- Wet marble floor, Dry marble floor, towel, newspaper
- Newspaper, towel, dry marble floor, wet marble floor

c) wet marble floor, dry marble floor newspaper and towel

d) Towel, newspaper, dry marble floor, wet marble floor

**Answer-**

c) Wet marble floor, dry marble floor, newspaper and towel.

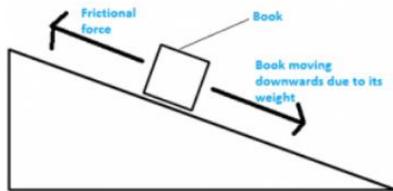
The nature of the surface in contact is one on which the force of friction depends. The rougher the surface, the more is the friction between the surfaces in contact and vice-versa. Roughness present in the given surfaces can be arranged in an ascending order as wet marble floor, dry marble floor, newspaper and towel. Hence, the correct sequence of these surfaces when arranged accordingly to the increase in the force of friction acting on the car is- wet marble floor, dry marble floor, newspaper and towel.

**Question-4**

**Suppose your writing desk is tilted a little. A book slides down which is kept on the table. With the help of the diagram, show the direction of frictional force acting on it.**

**Answer-**

When book slides down on the desk, a frictional force acts between the book and the surface of the desk. The direction of the friction force on the book is opposite to the direction of its motion and acts in an upward direction. It is shown in the diagram below:



**Question-5**

**If a bucket of soapy water is spilled on the marble floor accidentally, is it easier or difficult for a person to walk on the floor?**

**Answer-**

It is easier to walk on the floor because of the friction present between our feet and the ground. For walking, we push the ground in a backward direction with our feet. The force of friction pushes it in the forward direction and allows us to walk. The force of friction decreases between the ground and the feet when there is soapy water spilled on the floor. Hence, it becomes difficult to walk on the soapy floor.

**Question-6**

**Why do sportsmen use shoes with spikes?**

**Answer-**

Sportsmen use shoes with spikes because of the better grip given by spikes while running. This is because the force of friction between the shoes and the ground increases with the help of spikes.

**Question-7**

**Rahul has to push a box and Rashmi has to push a similar heavier box on the same floor. Who will have to apply a larger force and why?**

**Answer-**

Due to the interlocking of the irregularities on the two surfaces in contact, the force of friction arises. On the floor when a heavy object is placed, the interlocking of irregularities on the surface of box and floor become strong. This is because the two surfaces in contact are pressed harder. Hence, more force is required to overcome the interlocking. Thus, to push the heavier box, Rashmi has to apply greater force than Rahul.

### Question-8

**Why is sliding friction lesser than the static friction? Explain.**

**Answer-**

When irregularities present in the surfaces of two objects in contact get interlocked with each other, friction came into play. The time given in sliding for interlocking is very small. Thus, interlocking is not strong. Therefore, less force is required to overcome this interlocking. Due to this reason, sliding friction is less than static friction.

### Question-9

**Give example to show that friction is both a friend and a foe.**

**Answer-**

Advantages of the friction:

- a) Due to friction, we are able to walk.
- b) We are able to write because of the friction between the tip of the pen and a paper.

Disadvantages of friction:

- a) Because of friction, the tires and soles of shoes wear out.
- b) Friction produces heat between different parts of the machines. This can damage the machines.

### Question-10

**Why must an object moving in a fluid have special shapes? Explain.**

**Answer-**

When a body moves through a fluid, it experiences an opposing force which tries to oppose its motion through the fluid. This opposing force is known as the drag force. This frictional force depends on the shape of the body. By giving the objects a special shape, the force of friction acting on it can be minimized. Hence, it becomes easier for a body to move through the fluid.