12 Friction

Multiple Choice Questions

1. Whenever the surfaces in contact tend to move or move with respect to each other, the force of friction comes into play
   (a) only if the objects are solid.
   (b) only if one of the two objects is liquid.
   (c) only if one of the two objects is gaseous.
   (d) irrespective of whether the objects are solid, liquid or gaseous.

2. 

   Fig. 12.1

   In Fig.12.1, a boy is shown pushing the box from right to left. The force of friction will act on the box
   (a) from right to left (←)
   (b) from left to right (→)
   (c) vertically downwards (↓)
   (d) vertically upwards (↑)

3. To sharpen the blade of a knife by rubbing it against a surface, which of the following will be most suitable?
   (a) stone
   (b) plastic block
   (c) wooden block
   (d) glass block

4. A toy car released with the same initial speed will travel farthest on
   (a) muddy surface
   (b) polished marble surface
   (c) cemented surface
   (d) brick surface

5. If we apply oil on door hinges, the friction will
   (a) increase
   (b) decrease
   (c) disappear altogether
   (d) will remain unchanged

6. Which of the following statements is incorrect?
   (a) Friction acts on a ball rolling along the ground.
   (b) Friction acts on a boat moving on water.
   (c) Friction acts on a bicycle moving on a smooth road.
   (d) Friction does not act on a ball moving through air.

7. A boy rolls a rubber ball on a wooden surface. The ball travels a short distance before coming to rest. To make the same ball travel longer distance before coming to rest, he may
   (a) spread a carpet on the wooden surface.
   (b) cover the ball with a piece of cloth.
   (c) sprinkle talcum powder on the wooden surface.
   (d) sprinkle sand on the wooden surface.

8. In a large commercial complex there are four ways to reach the main road. One of the path has loose soil, the second is laid with polished marble, the third is laid with bricks and the fourth has gravel surface. It is raining heavily and Paheli wishes to reach the main road. The path on which she is least likely to slip is
   (a) loose soil.
   (b) polished marble.
   (c) bricks.
   (d) gravel.

VERY SHORT ANSWER QUESTIONS

9. Two blocks of iron of different masses are kept on a cemented floor as shown in Fig.12.2. Which one of them would require a larger force to move it from the rest position?



Fig. 12.2

10. Will force of friction come into play when a rain drop rolls down a glass window pane?

11. Two boys are riding their bicycles on the same concrete road. One has new tyres on his bicycle while the other has tyres that are old and used. Which of them is more likely to skid while moving through a patch of the road which has lubricating oil spilled over it?

12. Fig. 12.3 shows two boys applying force on a box. If the magnitude of the force applied by each is equal, will the box experience any force of friction?

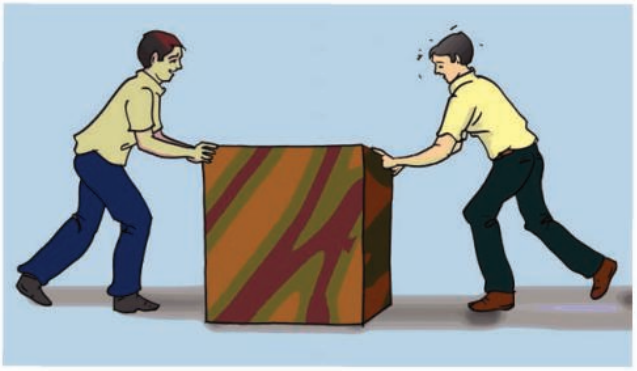


Fig. 12.3

13. Imagine that an object is falling through a long straight glass tube held vertical; air has been removed completely from the tube. The object does not touch the walls of the tube. Will the object experience any force of friction?

SHORT ANSWER QUESTIONS

14. You might have noticed that when used for a long time, slippers with rubber soles become slippery. Explain the reason.

15. Is there a force of friction between the wheels of a moving train and iron rails? If yes, name the type of friction. If an air cushion can be introduced between the wheel and the rail, what effect will it have on the friction?

16. Cartilage is present in the joints of our body, which helps in their smooth movement. With advancing age, this cartilage wears off. How would this affect the movement of joints?

17. While playing tug of war (Fig.12.4), Preeti felt that the rope was slipping through her hands. Suggest a way out for her to prevent this.

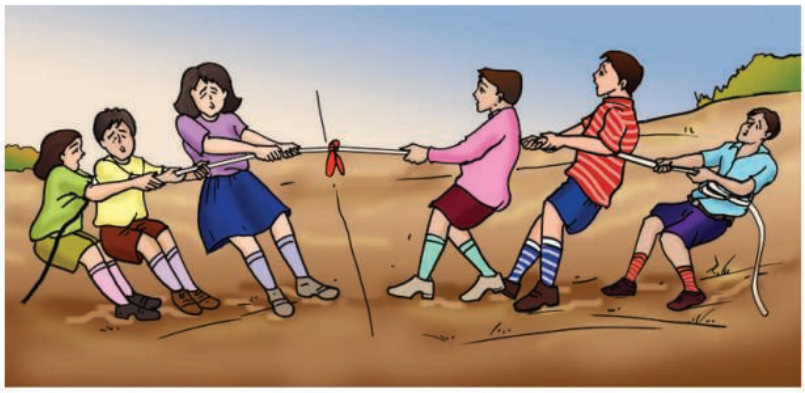


Fig. 12.4

18. The handle of a cricket bat or a badminton racquet is usually rough. Explain the reason.

19. Explain why the surface of mortar and pestle (silbatta) used for grinding is etched again after prolonged use?

20. A marble is allowed to roll down an inclined plane from a fixed height. At the foot of the inclined plane, it moves on a horizontal surface (a) covered with silk cloth (b) covered with a layer of sand and (c) covered with a glass sheet. On which surface will the marble move the shortest distance. Give reason for your answer.

21. A father and son pushed their car to bring it to the side of road as it had stalled in the middle of the road. They experienced that although they had to push with all their might initially to move the car, the push required to keep the car rolling was smaller, once the car started rolling. Explain.

LONG ANSWER QUESTIONS

22. When the cutting edge of a knife is put against a fast rotating stone to sharpen it, sparks are seen to fly. Explain the reason.

23. We have two identical metal sheets. One of them is rubbed with sand paper and the other with ordinary paper. The one rubbed with sand paper shines more than the other. Give reason.

24. While travelling on a rickshaw, you might have experienced that if the seat cover is very smooth, you tend to slip when brakes are applied suddenly. Explain.

25. Two friends are trying to push a heavy load as shown in Fig.12.5. Suggest a way which will make this task easier for them.



Fig. 12.5