

Friction - Quiz

Multiple Choice Questions

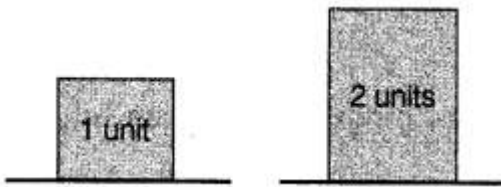
- To sharpen the blade of a knife by rubbing it against a surface, which of the following will be most suitable?
a. Stone b. Wooden Block c. Plastic Block d. Glass Block
- A toy car released with the same initial speed will travel farthest on
a. Muddy Surface b. Cemented Surface c. Polished marble surface d. Brick Surface
- 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
- 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. Bricks c. Polished marble d. Gravel
- The maximum friction that balances the force applied to a body resting on a solid surface so that the body does not move is called
a. Limited friction b. Static friction c. Sliding friction d. Rolling Friction
- Why are tyres of cars, buses, and trucks treaded?
a. To increase the friction between tyre and road for better gripping
b. To decrease the friction between tyre and road for better gripping
c. To reduce wearing and tearing of tyres
d. To reduce heat between road and tyre
- Which substance is coated on moving parts of machines to reduce friction?
a. Grease b. Oil c. Boric acid d. Both (a) and (b)
- What is a streamlined shape?
a. Shape that is blunt in the front b. Shape that is pointed in the front
c. Shape that is rounded in the front d. Shape that is rounded and wavy in the front

9. Why does a mixer-grinder running continuously for a long period of time feels warm?
- Friction converts a part of electrical energy into heat
 - Friction converts a part of heat energy into electrical energy.
 - Mixer-grinder jar is made of low quality material.
 - Current flowing through the circuit is low.
10. Friction is
- Always a disadvantage
 - Always a advantage
 - Sometimes a disadvantage and sometimes an advantage
 - Neither a disadvantage nor an advantage
11. It is difficult to walk on ice because
- Pressure is high
 - Pressure is low
 - Friction is high
 - Friction is low
12. Friction can be increased by
- Making the surface smooth
 - Lubricating the surfaces
 - Using ball bearings
 - Making the surface rough
13. Ball bearings are useful because
- Rolling friction is more than sliding friction
 - Rolling friction is less than sliding friction
 - Rolling friction is same as sliding friction
 - It is easier to apply grease to ball bearing to reduce friction.

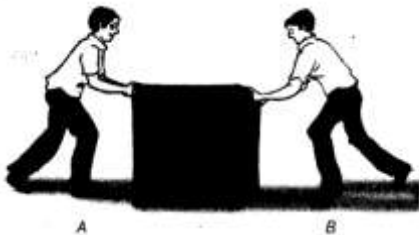
Answer the following Questions

- Bakers on cars will work best if the friction between the brake shoes and wheels is reduced. True or false?
- A machine with moving parts will become less hot while running if it is well lubricated. True or false?
- An object is moving from north to south. What is the direction of the force of friction on the object?
- If there was not friction, what would happen to a moving object?
- When you rub your hands together, they become warm. What is this due to?
- If you try to hold a glass with oil on your hands, it tends to slip. Why?
- Why do you think rolling friction is less than sliding friction?
- Friction is a necessary evil. Explain.

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



10. 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?
11. In figure, 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?



12. 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?
13. You might have noticed that when used for a long time, slippers with rubber soles become slippery. Explain the reason.
14. 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?
15. 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?
16. While playing tug of war as shown in figure, Preeti felt that the rope was slipping through her hands. Suggest a way out for her to prevent this.



17. The handle of a cricket bat or a badminton racquet is usually rough. Explain the reason.
18. Explain why the surface of mortar and pestle (silbatta) used for grinding is etched again after prolonged use?
19. 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.
20. 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.
21. 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.
22. 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.
23. 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.
24. Two friends are trying to push a heavy load as shown in figure, Suggest a way which will make this task easier for them.



25. **Give reasons for the following:**
- a) We slip when we step on a banana peel.
 - b) Tyres of vehicles have treads on them.
 - c) Friction is both a boon and a bane to us.
 - d) Parts of machines are regularly oiled and greased.
 - e) We sprinkle powder on the carom board.
26. What kind of tyres are used in racing cars and why?

ANSWER

Multiple Choice Questions

1. a
2. c
3. c
4. d
5. a
6. a
7. d
8. b
9. a
10. c
11. d
12. d
13. a

Answer the following Questions

1. False. Frictional force helps in reducing the motion of a body. More the friction, more the opposing force and faster the stoppage of the car.
2. True
Friction causes loss of energy in the form of heat. When a machine is well lubricated, friction is reduced; therefore, less heat is produced.
3. Frictional force acts in the direction opposite to the direction of motion of a body. Because the object is moving from north to south, the direction of frictional force is from south to north.
4. Friction affects the relative motion between two surfaces in contact. Without friction, objects would not be able to move from a stationary position or stop when in motion. When a body is in motion and if there is no friction, it becomes impossible to bring it to rest. Think of a situation when you are travelling in a car and you cannot stop it because there is no friction between the surface of the tyres and that of the road. It will be a disadvantage in this case.
5. Friction between the surfaces of hands produces heat, which makes them warm when rubbed together. When you rub your hands together, it causes friction. This leads to the production of heat, which makes your hands warm. This is because of the roughness of the surfaces of hands. It is a classic example of the conversion of mechanical energy to heat energy.
6. Friction between two surfaces in contact is reduced when the surfaces are lubricated. Oil is a lubricating agent. Hence, when you try holding a glass with oil on your hands, it tends to slip.
7. Rolling friction is less than sliding friction because of the minimal surface of contact between two surfaces. For a rolling body, the contact surface area is less and goes on changing. In case of rolling

friction, we can assume that a point of a body is in contact with a surface; while in case of sliding friction, the whole surface area of the body is in contact with the surface.

8. Friction affects the relative motion between two bodies in contact. Without friction, objects cannot move from a stationary position or stop when in motion. Suppose you are walking on the road and encounter a smooth surface. You will fall because there will be no friction to hold your feet firmly on the surface. Now, let us change the situation. Let us suppose you are standing on a smooth surface and you are asked to walk on that surface. Again, you will not be able to walk properly because of lack of friction. Hence, friction is a necessary evil.
9. Larger force will be required to move the heavier block.
10. The bicycle with worn out tyres is more likely to skid.
11. Force of friction will be zero as the net force on the box is zero.
12. No.
13. When rubber soles are used for a long time, their surfaces become smooth. Hence, the friction between the sole and the floor decreases. Therefore, slippers become slippery.
14. Yes, rolling friction. If an air cushion is introduced between the wheel and the rails, the friction will decrease.
15. The wearing off of cartilage will increase the friction. As a result the movement of joints will become difficult which may lead to joint pains.
16. She may rub soil to increase friction between the rope and her hand.
17. To increase friction between handle of the bat and hands, to have a better grip.
18. To increase friction to make it more effective for grinding again.
19. On the surface covered with sand, it will cover the least distance because sand offers maximum friction against its motion.
20. Because initially they had to apply force to set the car in motion but once the car started rolling, they had to apply force only to balance rolling friction of the car, the value of which is very less.
21. Friction between grinding stone and the cutting edge of the knife produces heat. As the friction is very large in this case, a large amount of heat is produced and we see sparks flying.
22. The friction between sand paper and metal sheet is very large, compared to that between the ordinary paper and the metal sheet. Thus the sand paper is able to remove the outer dull layer from the metal sheet more effectively and makes it more shining.
23. If the seat cover is very smooth then the friction between our body and the seat is very small. Therefore, when the brakes are applied we tend to slip.
24. They can put rollers below the heavy load. Since, the rolling friction is smaller than the sliding friction putting rollers below the heavy load will make the task easier for them.
25.
 - a) The peel makes the surface smooth, so the friction between our feet and ground decreases, causing us to fall when we step on a banana peel.
 - b) The tyres of vehicles have treads in them to increase the friction between the tyre and the road and to prevent skidding.

c) **Friction** is both the **boon** and the **bane** of our everyday lives. It's the force that drags against your car's tires, making you use more gas to keep going. It's also the force that allows your car to stop at all: Without **friction**, brakes would be dead weight.

d) **Machines parts are frequently oiled and greased**

Friction occurring in the machines and their components creates heat and hampers the functioning of it. Oil and grease lubricate the machine parts and help in reducing the friction and also a smooth running of the machine. Thus the machine works efficiently and does not tear in the long run.

e) **We sprinkle powder on carom board** to make the surface of the **board** smooth. This reduces the friction between the surface of the **carom board**, the striker and the coins. As a result, the coins and the striker can move easily on the **carom board**.

26. A **racing slick** (also known as a "slick **tyre**") is a type of **tyre** that has a smooth tread **used** mostly in **auto racing**. **Slick** tyres provide far more friction than grooved tyres on dry roads, due to their greater contact area but typically **have** far less friction than grooved tyres under wet.