

- (Q.) When does a body start moving?** (1 Mark)
- (Ans) A body starts moving when the applied force is greater than the frictional force.
- (Q.) What is the cause of friction?** (1 Mark)
- (Ans) When two bodies slide over one another, the irregularities on the two surfaces in contact get interlocked and the force of friction comes to play. This opposes the motion.
- (Q.) What is rolling friction?** (1 Mark)
- (Ans) When one body rolls over the surface of another body, the frictional force that comes into play between the two surfaces is called rolling friction.
- (Q.) What do you mean by the term drag?** (1 Mark)
- (Ans) Liquids and gases exert force of friction when an object moves through them. The frictional force exerted by the fluids is termed as drag.
- (Q.) What is the direction of frictional force?** (1 Mark)
- (Ans) Frictional force acts in the direction opposite to the direction of motion.
- (Q.) Give one difference between frictional force and gravitational force.** (1 Mark)
- (Ans) Frictional force is an opposing or resistive force while gravitational force is attractive in nature.
- (Q.) What is force of friction?** (1 Mark)
- (Ans) When two bodies move (slide) over each other, a force comes into play between the two surfaces in contact, which acts in the opposite direction of the applied force. This opposite force is called the friction force and it opposes the motion of one body.
- (Q.) Frictional force is used to stop a moving bicycle. How?** (1 Mark)
- (Ans) When the brake levers are pressed, the brake shoes press against the rim of the wheel. This increases the friction and hence the bicycle stops.
- (Q.) State the factors on which friction depends?** (2 Marks)
- (Ans) Friction depends on  
(i) the nature of the surfaces in contact  
(ii) how hard the two surfaces press together.
- (Q.) Why do kabaddi players rub their hands with soil while playing?** (2 Marks)
- (Ans) Kabaddi players rub their hands with soil while playing to increase the friction for better grip.

## FRICTION

**(Q.) Give reasons for the following:**

**(a) Sparks are produced when a pair of scissors is sharpened against a grinding wheel.**

**(b) A piece of chalk wears out as it is used on a black board.** (2 Marks)

(Ans) (a) When scissors are rubbed against wheel, due to friction, heat is produced resulting into sparks.

(b) For writing on blackboard with chalk we use frictional force and this force cause wearing of the chalk.

**(Q.) Wet surfaces are more slippery. Give reason.** (2 Marks)

(Ans) Water of a wet surface acts as a lubricant. It fills the fine pores of the surfaces, which makes them smooth and thus reduces friction. Due to this decrease in friction the surface becomes more slippery.

**(Q.) Explain, why a hovercraft travels much faster than a streamer pushing through water?** (2 Marks)

(Ans) A hovercraft travels much faster than a steamer because of difference in their body shape of the two. Air friction is very less as compared to the friction exerted by the water, this is because gases are less viscous as compared to the liquids.

**(Q.) What do you mean by the force of friction? How can it be minimised?** (3 Marks)

(Ans) Whenever a body actually moves over a surface, a force appears in a direction opposite to the motion. This is frictional force which always opposes the motion of a body over a given surface.

Frictional force can be minimized by

(a) rolling the body over a surface instead of sliding

(b) using lubricants like oil, grease, etc.

**(Q.) Give reasons**

**(a) Powder is applied to a carom board.**

**(b) A man walking on a street slips on a banana skin.**

**(c) Oil is applied to the moving part of a machine.**

(3 Marks)

(Ans) (a) Powder applied to a carom board serves as a lubricant and makes the surface slippery by reducing friction. This results in easy sliding of coin.

(b) Banana skin reduces the friction between the sole of feet and the street. It makes the surface slippery and makes the man slip over.

(c) Oiling of parts of machines acts as a lubricant and reduces the friction between the moving parts and thus reducing its wear and tear.

**(Q.) Friction produces heat. Give one advantage and one disadvantage of this property.** (3 Marks)

(Ans) Friction between two surfaces produce heat.

Advantage : Production of heat by rubbing of palms against each other during winter.

Disadvantage: Machine parts get heated up and lead to wear and tear.

**(Q.) Mention three ways in which friction between two surfaces can be minimised.** (3 Marks)

(Ans) The three ways of minimizing friction between two surfaces are

(i) Polishing of the roughened surfaces

(ii) Use of grease and lubricants

(iii) Use of ball bearings between moving surfaces of machine parts

## FRICTION

**(Q.) Mention three examples by which friction between two surfaces can be increased.** (3 Marks)

(Ans) The three examples of increasing friction between the two surfaces are

- (a) Increasing the threading of the tyres and shoe soles
- (b) Applying brake pads of the brake system of the bicycles and automobiles
- (c) Applying coarse material like sand on the hands of the kabaddi players to increase grip.

**(Q.) State and explain different types of friction.** (3 Marks)

(Ans) There are three types of friction:

- (i) Static friction: The friction that exists between the surfaces in contact when there is no relative motion is called static friction.
- (ii) Dynamic or sliding friction: The friction that exists between the surfaces in contact when a body slides on the surface of another body is known as the sliding friction.
- (iii) Rolling friction: The friction that exists between the surfaces in contact when a body rolls over the surface of another body is known as the rolling friction.

For any two surfaces in contact during motion:

Rolling friction < Sliding friction < Static friction.

**(Q.) Define force of friction . How is the force of friction disadvantageous ?** (5 Marks)

(Ans) When two surfaces slide over each other, the force, which opposes the motion of one body over the other, is called force of friction.

Disadvantage of frictional forces are seen as:

- (i) Wear and tear of objects coming in contact. Example: soles of shoes and tyres of vehicles.
- (ii) Loss of energy as heat. Example: Machine parts get heated up and lead to wear and tear.
- (iii) Loss of energy to overcome friction. Example: Wastage of fuel in machinery.

**(Q.) Mention three disadvantages of friction between the parts of a machine. How does (a) oiling and (b) using ball bearings help reduce friction?** (5 Marks)

(Ans) Three disadvantages of friction between the parts of a machine are

1. Lot of heat is produced
2. Lot of energy is wasted
3. There is wear and tear of different parts

Friction can be reduced by

- (a) By oiling: Oil act as a lubricant. It fills up the dents (irregularities) of the surfaces that move against each other in a machine. It also prevents direct contact between the surfaces by forming a film between the surfaces.
- (b) By using ball bearings: Use of ball bearings converts sliding friction into rolling friction. Rolling friction is less than sliding friction. The ball bearings are used between the hubs and the axles of bicycle, and fans.

