

# Science

([www.tiwariacademy.net](http://www.tiwariacademy.net))

(Chapter 9)(Force and Laws of Motions)(Intext Questions)

Class - 9

Page 118

## Question 1:

Which of the following has more inertia: (a) a rubber ball and a stone of the same size? (b) a bicycle and a train? (c) a five-rupees coin and a one-rupee coin?

### Answer 1:

Inertia is the measure of the mass of the body. The greater is the mass of the body; the greater is its inertia and vice-versa.

(a) Mass of a stone is more than the mass of a rubber ball for the same size. Hence, inertia of the stone is greater than that of a rubber ball.

(b) Mass of a train is more than the mass of a bicycle. Hence, inertia of the train is greater than that of the bicycle.

(c) Mass of a five rupee coin is more than that of a one-rupee coin. Hence, inertia of the five rupee coin is greater than that of the one-rupee coin.

## Question 2:

In the following example, try to identify the number of times the velocity of the ball changes:

"A football player kicks a football to another player of his team who kicks the football towards the goal. The goalkeeper of the opposite team collects the football and kicks it towards a player of his own team".

Also identify the agent supplying the force in each case.

### Answer 2:

The velocity of the ball changes four times.

As a football player kicks the football, its speed changes from zero to a certain value. As a result, the velocity of the ball gets changed. In this case, the player applied a force to change the velocity of the ball. Another player kicks the ball towards the goal post. As a result, the direction of the ball gets changed. Therefore, its velocity also changes.

In this case, the player applied a force to change the velocity of the ball. The goalkeeper collects the ball. In other words, the ball comes to rest. Thus, its speed reduces to zero from a certain value. The velocity of the ball has changed. In this case, the goalkeeper applied an opposite force to stop/change the velocity of the ball. The goalkeeper kicks the ball towards his team players. Hence, the speed of the ball increases from zero to a certain value. Hence, its velocity changes once again. In this case, the goalkeeper applied a force to change the velocity of the ball.

[www.tiwariacademy.com](http://www.tiwariacademy.com)

A Free web support in education

# Science

([www.tiwariacademy.net](http://www.tiwariacademy.net))

(Chapter 9)(Force and Laws of Motion)(Intext Questions)

Class - 9

## Question 3:

Explain why some of the leaves may get detached from a tree if we vigorously shake its branch.

## Answer 3:

Some leaves of a tree get detached when we shake its branches vigorously. This is because when the branches of a tree are shaken, it moves to and fro, but its leaves tend to remain at rest. This is because the inertia of the leaves tend to resist the to and fro motion. Due to this reason, the leaves fall down from the tree when shaken vigorously.

## Question 4:

Why do you fall in the forward direction when a moving bus brakes to a stop and fall backwards when it accelerates from rest?

## Answer 4:

*Due to the inertia of the passenger*

Everybody tries to maintain its state of motion or state of rest. If a body is at rest, then it tries to remain at rest. If a body is moving, then it tries to remain in motion. In a moving bus, a passenger moves with the bus. As the driver applies brakes, the bus comes to rest. But, the passenger tries to maintain his state of motion. As a result, a forward force is exerted on him.

Similarly, the passenger tends to fall backwards when the bus accelerates from rest. This is because when the bus accelerates, the inertia of the passenger tends to oppose the forward motion of the bus. Hence, the passenger tends to fall backwards when the bus accelerates forward.

[www.tiwariacademy.com](http://www.tiwariacademy.com)

A Free web support in education