CBSE Class 9 Science

Chapter 9 - Force and Laws of Motion

Extra Questions and Answers

1. What is the necessary condition to change the shape or position of an object?

Answer:

Application of force is necessary to change the shape or position of an object.

2. Which of the following two types of forces will bring the motion in an object?

(a) Balanced force

(b) Unbalanced force

Answer:

(a) Unbalanced force

3. Why are safety belts provided in vehicles?

Answer:

When we are sitting in a moving vehicle our body is also in the state of motion. But when the vehicle stops car stops abruptly on the application of brakes or on colliding with some other vehicle, our body tends to remain in motion due to its inertia. This may cause injury to us by hitting with the panels in front. Safety belt is worn to prevent such accidents as it exerts an unbalanced force on our body to make the forward motion slower.

4. Which of the following is a measure of inertia?

(a) Velocity of an object

(b) Mass of an object

(c) Volume of an object

(d) All of the above

Answer:

(b) Mass of an object; Larger the mass of an object, greater will be its inertia.

5. Why does a boat move backward when a man jumps out of it?

Answer:

This is due to Newton's third law of motion which states that for every action, there is an equal and opposite reaction. As the man jumps forward, the force on the boat moves it backward.

6. Define one Newton force.

Answer:

One Newton is defined as the force that is required to accelerate a mass of 1kg by $1m/s^2$ in the direction of applied force. It is the SI unit of force.

7. Write mathematical formulation of Newton's second law of motion.

Answer:

Newton's second law of motion can be mathematically expressed as follows:

$F \propto ma$

or $F = kma$

Where,

- F is the force
- k is the constant of proportionality
- m is the mass of the object
- a is the acceleration

8. When we kick a football it flies high but a stone of the same size hardly moves a distance on kicking with the same force. Why?

Answer:

The mass of a body is a measure of its inertia. It means that larger the mass of a body, larger will be the inertia offered by the body to change its state of motion. Now as the football has a mass larger than that of the football, it resists a change in its motion better than the football. This is the reason that it will move hardly on kicking.

9. Calculate the force exerted by the brakes on the motorcar which is moving with a velocity of 72 km/h and takes 5 s to stop after the application of brakes. Mass of the motorcar along with the passengers is 800 kg.

Answer:

Force = – 3200 kg m s^{-2} or – 3200 N

10. What is the SI unit of momentum?

Answer:

SI unit of momentum is kg m s^{-1}.