

Q. 03 Is it possible for a body to have inertia but no weight?

Sol: The weight of a body is the force with which it is attracted towards the centre of the earth. When a body is stationary with respect to the earth, its weight equals gravity. This weight of the body is known as its static or true weight.

Inertia is a property of mass. Hence, a body can have inertia (i.e., mass) but no weight. Everybody always has inertia but its weight (mg) can be zero when it is taken at the centre of the earth or during free fall under gravity or a body placed at a very large distance from earth. Basically, the weight of a body can be zero when acceleration due to gravity is zero, that condition is called weightlessness.

For example, When a satellite revolves in its orbit around the earth:

Weightlessness possess many serious problems for the astronauts. It becomes quite difficult for them to control their movements. Everything in the satellite has to be kept tied down. They can be displaced due to their inertia. The creation of artificial gravity is the answer to this problem.