# 5 Lecture - PHY101

## **Important Subjective**

#### What is Newton's first law of motion?

**Answer:** Newton's first law of motion states that an object at rest will remain at rest, and an object in motion will remain in motion at a constant velocity unless acted upon by an external force.

### What is the law of inertia?

**Answer:** The law of inertia is another name for Newton's first law of motion, which states that an object will resist changes in its state of motion.

#### How do seat belts in cars demonstrate the first law of motion?

**Answer:** Seat belts in cars provide an external force that acts on passengers, preventing them from moving forward and reducing the risk of injury in a sudden stop.

#### What external forces are used to ensure the stability of skyscrapers?

**Answer:** Engineers use external forces, such as dampers and braces, to counteract the motion caused by wind and earthquakes and ensure the stability of skyscrapers.

#### What is Newton's second law of motion?

**Answer:** Newton's second law of motion states that the force acting on an object is equal to its mass multiplied by its acceleration (F = ma).

## How is Newton's second law relevant in the sport of baseball?

**Answer:** The force applied by a pitcher to a baseball is determined by the mass of the ball and the desired acceleration, as described by Newton's second law.

#### What is the principle behind rocket propulsion?

**Answer:** The principle behind rocket propulsion is Newton's third law of motion, which states that for every action, there is an equal and opposite reaction.

## How do jet engines operate based on Newton's third law of motion?

**Answer:** Jet engines operate by expelling exhaust gases at high speed in one direction, which propels the aircraft in the opposite direction, in accordance with Newton's third law.

## How is Newton's third law relevant in the launch of spacecraft?

**Answer:** The force of the exhaust gases expelled from the rocket engine propels the spacecraft in the opposite direction, in accordance with Newton's third law.

## What is the significance of Newton's laws of motion in daily life?

**Answer:** Newton's laws of motion are fundamental concepts in physics that have a wide range of applications in our daily lives, from the design of safety devices to the construction of buildings and the operation of vehicles and machinery.