

6 Lecture - PHY101

Important Subjective

Explain the concept of terminal velocity.

Answer: Terminal velocity is the maximum velocity that an object can achieve when falling through a fluid, such as air or water. As the object falls, the fluid resistance increases, slowing down its acceleration until the upward force due to the fluid resistance equals the downward force due to gravity. At this point, the net force acting on the object becomes zero, and the object continues to fall at a constant velocity, known as the terminal velocity.

What is the difference between static and kinetic friction?

Answer: Static friction is the force that resists the motion of an object at rest, while kinetic friction is the force that opposes the motion of an object in motion. Static friction is generally greater than kinetic friction, and it must be overcome to set an object in motion.

Can an object be in equilibrium if it is accelerating?

Answer: No, an object cannot be in equilibrium if it is accelerating. Equilibrium means that the net force acting on an object is zero, which means that the object is either at rest or moving at a constant velocity. If an object is accelerating, then the net force acting on it is not zero, and it is not in equilibrium.

Explain the concept of tension force.

Answer: Tension force is the force that is transmitted through a string, rope, cable or wire when it is pulled tight by forces acting on either end. It acts in the direction of the string, pulling the object in that direction. Tension force can be found in many situations, such as when lifting an object with a crane or pulling an object with a pulley.

What is the relationship between mass and weight?

Answer: Mass is a measure of the amount of matter in an object, while weight is a measure of the force of gravity acting on an object. The weight of an object is equal to its mass multiplied by the acceleration due to gravity. Therefore, the weight of an object will vary depending on the strength of the gravitational field it is in, while its mass will remain constant.

How does air resistance affect the motion of an object?

Answer: Air resistance is a force that opposes the motion of an object through the air. It increases as the speed of the object increases and can eventually become equal in magnitude to the force of gravity, causing the object to reach its terminal velocity. Air resistance can also affect the trajectory of an object, causing it to deviate from its expected path.

What is the difference between elastic and inelastic collisions?

Answer: In an elastic collision, the total kinetic energy of the objects involved is conserved, meaning that no energy is lost to other forms, such as heat or sound. In an inelastic collision, some or all of the kinetic energy is lost to other forms of energy. The objects may stick together after the collision, and the final velocity of the objects may be different from their initial velocities.

What is impulse and how is it related to force and time?

Answer: Impulse is the product of force and time and is equal to the change in momentum of an object. It is related to force and time because a greater force acting for a longer period of time will produce a greater change in momentum, and therefore a greater impulse.

What is the law of action and reaction?

Answer: The law of action and reaction, also known as Newton's third law, states that for every action, there is an equal and opposite reaction. This means that when one object exerts a force on another object, the second object will exert an equal and opposite force back on the first object.

How does friction affect the motion of an object on an inclined plane?

Answer: Friction opposes the motion of an object on an inclined plane