

10 Lecture - PHY101

Important Subjective

What is rotational kinematics?

Ans: Rotational kinematics is the branch of physics that deals with the motion of objects that are rotating or spinning around a fixed axis.

What is angular velocity?

Ans: Angular velocity is the rate of change of angular displacement with respect to time. It is a vector quantity, and its SI unit is rad/s.

What is angular acceleration?

Ans: Angular acceleration is the rate of change of angular velocity with respect to time. It is a vector quantity, and its SI unit is rad/s².

What is centripetal acceleration?

Ans: Centripetal acceleration is the acceleration of an object that is moving in a circular path. It always points towards the center of the circle and is given by the formula $a = v^2/r$, where v is the velocity of the object and r is the radius of the circle.

What is the relationship between linear velocity and angular velocity?

Ans: The linear velocity of an object is equal to the product of its angular velocity and the radius of the circle it is moving in. This is given by the formula $v = \omega r$, where v is the linear velocity, ω is the angular velocity, and r is the radius of the circle.

What is rotational inertia?

Ans: Rotational inertia is the property of an object that resists changes to its rotational motion. It is dependent on the object's mass distribution and its distance from the axis of rotation.

What is torque?

Ans: Torque is the measure of the force that causes an object to rotate around an axis or pivot point. It is given by the formula $\tau = r \times F$, where τ is the torque, r is the distance from the axis of rotation to the point where the force is applied, and F is the force applied.

What is the relationship between torque and angular acceleration?

Ans: The torque applied to an object is directly proportional to its angular acceleration. This is given by the formula $\tau = I\alpha$, where τ is the torque, I is the moment of inertia, and α is the angular acceleration.

What is the moment of inertia?

Ans: The moment of inertia is a measure of an object's resistance to changes in its rotational motion. It is dependent on the object's mass distribution and its distance from the axis of rotation.

What is the conservation of angular momentum?

Ans: The conservation of angular momentum states that the total angular momentum of a system remains constant if no external torque is acting on the system. This is similar to the conservation of linear momentum, which states that the total linear momentum of a system remains constant if no external forces are acting on the system.