

14 Lecture - PHY101

Important Subjective

What is meant by the equilibrium of a rigid body?

Answer: The state of a rigid body when it is at rest and all the forces acting on it are balanced is called the equilibrium of a rigid body.

What are the conditions for the equilibrium of a rigid body?

Answer: The conditions for the equilibrium of a rigid body are:

The net force acting on the body must be zero.

The net torque (or moment) acting on the body about any axis must be zero.

What is meant by the center of gravity of a rigid body?

Answer: The center of gravity of a rigid body is the point where the entire weight of the body can be considered to be concentrated, and the body behaves as if all its weight is acting through this point.

How is the center of gravity of a uniform object located?

Answer: The center of gravity of a uniform object is located at the geometric center of the object.

What is the difference between stable, unstable, and neutral equilibrium?

Answer: In stable equilibrium, if the body is displaced from its equilibrium position, it will tend to return to its original position. In unstable equilibrium, if the body is displaced from its equilibrium position, it will tend to move away from its original position. In neutral equilibrium, if the body is displaced from its equilibrium position, it will remain in its new position.

What is meant by torque or moment of a force?

Answer: The torque or moment of a force is the measure of the force's ability to cause rotational motion. It is the product of the force and the perpendicular distance between the force's line of action and the axis of rotation.

What is the principle of moments?

Answer: The principle of moments states that in equilibrium, the sum of the clockwise moments about any point must be equal to the sum of the anticlockwise moments about the same point.

How can the weight of an irregularly shaped object be determined?

Answer: The weight of an irregularly shaped object can be determined by suspending it from different points and measuring the angle of the supporting string or rod. The weight can be calculated using the principle of moments.

What is meant by the term 'couple'?

Answer: A couple is a pair of equal and opposite forces acting on a body but not along the same line. It causes the body to rotate without any translational motion.

How can the stability of a structure be increased?

Answer: The stability of a structure can be increased by:

Lowering the center of gravity

Increasing the base area

Providing adequate support

Increasing the weight of the structure at the base.