CBSE Class 11 Physics Notes Chapter 6: The fascinating chapter on work, energy, and power in CBSE Class 11 Physics is here! This chapter deconstructs some of the most basic ideas in physics that underpin motion and energy transitions in the cosmos. This chapter provides an extensive grasp of the dynamics of energy in many physical systems, ranging from comprehending the idea of work done by forces to investigating the numerous types of energy and its interconversion.

We offer you this Class 11 Notes on Work, Energy, and Power as a free PDF download to help you on your learning path. It summarises the main ideas, formulas, and real-world applications of the subject. With these notes at your disposal, you may set out on an exciting journey to understand the fundamental ideas that influence the behaviour of physical systems and the dynamic interactions between them. Come with me as we explore and reveal the mysteries of this fascinating world!

CBSE Class 11 Physics Notes Chapter 6

WORK

The term "work" in physics refers to "mechanical work." When a body is genuinely moved a certain distance in the direction of an applied force, that force is said to have worked on the body.

Nonetheless, in the event that the body is not moved in the direction of the applied force, no work is performed; that is, there is zero work done under such circumstances.

DIMENSIONS AND UNITS OF WORK

Absolute Units

Joule: In the SI system of units, it is the absolute unit of work. When a force of one newton truly propels a body one metre in the direction of applied force, that work is referred to as one joule.

Erg: In the CGS system of units, it is the absolute unit of work. When a force of one dyne really moves a body one centimetre in the direction of applied force, that movement is referred to as one erg of work.

Gravitational Units

These are sometimes referred to as workable units of work.

The SI system of units uses the kilogram-meter (kg-m) as the gravitational unit of work. When a force of one kgf moves a body one metre in the direction of the applied force, the movement is referred to as one kg-m of work done.

The gravitational unit of labour in the CGS system of units is the gram-centimeter (g-cm). One g-cm of work is completed when one gf of force is applied.

transports a body one centimetre in the direction of the applied force.

NATURE OF WORK DONE

For instance, when we press firmly on a wall, there is no displacement, hence the force applied to the wall is ineffective. But while this is going on, our internal energy is being depleted as our muscles alternately contract and relax. That's the reason we do become fatigued.

WORK DONE BY A VARIABLE FORCE

Graphical Method

It is uncommon to find a steady force. The force that is experienced more frequently is the variable force.

Let's examine a force with a variable magnitude that acts in a fixed direction, such as the x-axis, in order to assess the work that the force does.

The labour required to move the body from point A to point B while this variable force is at work must be calculated.

In order to make things easier, we'll assume that the whole displacement from point A to point B consists of a lot of tiny displacements.

Mathematical Treatment (of work done by a variable force)

CONSERVATIVE & NONCONSERVATIVE FORCES

Conservative Force

When the effort required to move a body is solely dependent on the starting and ending positions of the object, rather than the type of path taken between them, a force is said to be conservative.

This implies that the effort required to move a body along any path between fixed initial and final positions would be the same for conservative forces, such as gravitational force.

Properties of Conservative Forces

The only factors that determine whether work is done in favour of or against a conservative force while moving a body are its starting and ending positions.

Work performed in support of or opposition to a conservative force is independent of the route the body takes to move from one starting point to the other.

When moving a body via a round trip (a closed path where the final position of the body matches with its initial position), the work done by or against a conservative force is always zero.

Non-conservative Forces

When the effort required to move a body from one place to another, whether by the force or against it, depends on the path used to get there, the force is said to be non-conservative.

Frictional forces, for example, are not conservative forces.

POWER

Power of a person or machine refers to the time rate at which work is done by it.

Units of Power

KINETIC ENERGY

The kinetic energy of a body refers to the energy possessed by the body by virtue of its motion.

Here are some examples:

- Because of its kinetic energy, a bullet fired from a gun can pass through a target.
- Utilising the kinetic energy of air, wind mills operate. For example, sailing ships make advantage of wind energy.
- Water's kinetic energy is used in water mills. For example, maize is ground using swift-moving streams.
- When a hammer strikes a nail, its kinetic energy drives the nail into a wooden block.

POTENTIAL ENERGY

The energy that a body possesses as a result of its configuration or position in a field is referred to as its potential energy.

Therefore, the energy that can be linked to the configuration (or arrangement) of a system of objects that apply forces to one another is known as potential energy. It goes without saying that a system's potential energy will alter if its configuration does.

Two important types of potential energy are:

1. Gravitational potential energy
2. Elastic potential energy.

Benefits of CBSE Class 11 Physics Notes Chapter 6

- The purpose of the carefully selected revision notes is to assist students in rapidly identifying key ideas from Work, Energy, and Power.
- Every idea is clarified in great detail.
- Because revision notes are written by subject matter experts in accordance with the curriculum, they are lucid and simple to understand.
- The development of solid conceptual foundations is aided by these revision notes on work, energy, and power, which is crucial for students as they near the end of their board and competitive test preparation.
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