

Mastering Physics Solutions Chapter 8 Potential Energy And Conservation Of Energy

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Chapter 8 Potential Energy And Conservation Of Energy Q.1CQ

Is it possible for the kinetic energy of an object to be negative? Is it possible for the gravitational potential energy of an object to be negative? Explain.

Solution:

The kinetic energy of the body is k

$$k = \frac{1}{2}mv^2$$

Here, m is the mass of the body, which is always positive

v the velocity of the body

k depends on the mass of the body and the square of the velocity, which is positive.

Thus, kinetic energy is always positive. It cannot be negative.

We know that gravitational potential energy is

$$U = mgh$$

Here, m the mass of the body

h the height of the body

g the acceleration due to gravity

However, it may be negative, since any level can be zero, and g is negative above the surface of the earth.

Thus, gravitational potential energy can be negative.