

Home Assignment

6. No, the method doesn't violate the law of conservation of energy because once the body falls from a height, then its mechanical energy changes into kinetic energy increasingly. A decrease within the mechanical energy is capable, rise in the kinetic energy of the body. Throughout, the method total energy of the body remains conserved. Therefore, a law of conservation of energy isn't desecrated.

9. $1 \text{ unit} = 1 \text{ kWh}$

$$1 \text{ kWh} = 3.6 \times 10^6 \text{ J}$$

$$\text{Therefore, } 250 \text{ units of energy} = 250 \times 3.6 \times 10^6 \\ = 9 \times 10^8 \text{ J}$$

12. Yes, Displacement is there of an object in the absence of any force acting on it. Suppose an obj. is moving with constant rate. The net force performing on it is zero. But there is a displacement on the motion of the ~~part~~ ^{article}. Hence there will be a displacement while not a force.

14.

$P = 1500 \text{ W} = 1.5 \text{ Power unit time}$ that the heater has operated
 $T = 10 \text{ Hours}$

Work done = Energy consumed by the heater
 Therefore, energy Consumed = $P \times T$
 $= 1.5 \times 10 = 15 \text{ kWh}$

15.

When an apparatus moves from its mean position P to either extreme position A to B, it raises through a height h on top of the mean level P. At this time, the K.E of the bob changes fully into P.E. It moves towards purpose P, its P.E becomes zero & also the bob possess solely K.E. This method is termed as long because the apparatus oscillates. The bob doesn't oscillate forever. It involves rest as a result of air resistance & over its motion. The apparatus loses K.E to beat this friction & stops once a while. The law of conservation of energy isn't destroyed as a result of the energy lost by the apparatus to beat friction is gained by its surroundings. Hence, the work done energy of the apparatus and also the encompassing system stay preserved.

6. An object with mass 'm' moving with velocity 'v' has kinetic energy $\frac{1}{2}mv^2$. In order to bring it to rest, its velocity has to be reduced to zero.

An external force has to absorb energy from the object. i.e. do negative work on it, equal to its kinetic energy or $-\frac{1}{2}mv^2$.

19. Acceleration is associated with obj. might be zero even once many forces are working on it. This happens once all the forces get rid of each other i.e. the net force working on the thing is zero. Hence the acceleration of the thing is zero. So $\Sigma F = 0$ is correct.

21. When the object falls freely towards the bottom, its mechanical energy decreases & K.E will increase because the object touches the bottom, all its mechanical energy gets reborn into K.E. Because the object hits the labourious ground, all its K.E gets reborn into heat & sound energy. It may also deform the bottom relying upon the character of the ground & therefore the quantity of K.E possessed by the thing.