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SUBJECT:- PHYSICS

CLASS:- IXTH

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SUBJECT TEACHER:- MR. NEEL NIRANJAN

CHAPTER 4. (WORK, ENERGY AND POWER REVISION)(BASED ON NCERT PATTERN)

Q1. An electric heater is rated 1500 W. How much energy does it use in 10 hours?

Ans:- Energy consumed by an electric heater can be obtained with the help of the expression,

$$P=W/t$$

where,

Power rating of the heater, $P = 1500 \text{ W} = 1.5 \text{ kW}$

Time for which the heater has operated, $t = 10 \text{ h}$

Work done = Energy consumed by the heater

Therefore, energy consumed = Power \times Time

$$= 1.5 \times 10 = 15 \text{ kWh}$$

Hence, the energy consumed by the heater in 10 h is 15 kWh or 15 units

Q2. Illustrate the law of conservation of energy by discussing the energy changes which occur when we draw a pendulum bob to one side and allow it to oscillate.

Why does the bob eventually come to rest? What happens to its energy eventually? Is it a violation of the law of conservation of energy?

Ans:- When the pendulum bob is pulled (say towards left), the energy supplied is stored in it in the form

Of PE on account of its higher position. When the pendulum is released so that it starts

moving towards right, then its PE changes into KE such that in mean position, it has

maximum KE, and Zero PE. As the pendulum moves towards extreme right, its KE

changes into PE such that at the extreme position, it has maximum PE and zero KE.

When it moves from this extreme position to mean position, its PE again changes to KE.

This illustrates the law Of conservation of energy. Eventually, the bob comes to rest,

because during each oscillation a part of the energy possessed by it transferred to air

and in overcoming friction at the point of suspension. Thus, the energy of the pendulum

is dissipated in air.

The law of conservation of energy is not violated because the energy merely changes

its form and is not destroyed