

Lesson no 6

WORK AND ENERGY

Q1- Encircle the correct answer from the given choices:

Answers:

(i)	c	(ii)	c	(iii)	c	(iv)	b	(v)	a
(vi)	c	(vii)	b	(viii)	c	(ix)	b	(x)	b

Q2- Define work - What is its SI unit?

Ans) When force is applied and body is displaced, then work is done - Its SI unit are joule.

$$1 \text{ joule} = 1 \text{ Nm}$$

Q3- When does a force do work? Explain -

Ans) When force acting on a body displaces it - Then work is said to be done.

Q4- Why do we need energy?

Ans) Energy is required to do work - Without energy work can not be done and so progress can not be made, without energy.

Q5- Define energy, give two types of mechanical energy.

Ans) Energy is defined as capacity of doing work.

There are two types of mechanical energy:

- i) Kinetic energy, which is due to motion.
- ii) Potential energy, which is due to position in a field.

Q6 - Define Kinetic energy and derive its relation.

Ans) Energy due to motion is called Kinetic energy.

If a ball moves with initial velocity v_i , after covering distance $= s$ it stops and its final velocity becomes zero ($v_f = 0$) - During this it does work against force of friction ($= f$).

where $-f = ma$ using formula -

$$v_f^2 - v_i^2 = 2as$$

We get $(0)^2 - v_i^2 = -2 \left(\frac{f}{m} \right) (s)$

$$\frac{1}{2} m v_i^2 = fs = K.E$$

Q7 - Define potential energy and derive its relation?

Ans) The energy due to position is called potential energy - Its is equal to work done against a conservation force like weight

$$P.E = \text{work}$$

$$P.E = (\text{force})(\text{distance})$$

$$P.E = (mg)(h)$$

Q8- Why fossils fuels are called non-renewable form of energy?

Ans) The fossils fuels are one used to get energy are consumed completely - So these are not renewable

Q9- Which form of energy is most preferred and why?

Ans) Heat energy is mostly preferred because it is used to run engines of every type -

Q10- How is energy converted from one form to another? Explain -

Ans) Energy can be converted into another form - For example heat energy is converted into mechanical energy and electrical energy can be converted into light and heat energy -

Q11) Name the five devices that convert electrical energy into mechanical energy -

Ans) The electrical energy is converted into mechanical energy by:

- i) Electrical motor ii) Drill machine iii) Electric fan
 iv) Grinder v) Elevator

Q12) Name a device that converts mechanical energy into electrical energy -

Ans) The electrical generator converts mechanical energy into electrical energy.

Q13) What is meant by the efficiency of a system?

Ans) The efficiency of a device is defined as the ratio of energy given to a device and the output form of energy.

Q14) How can you find the efficiency of a system?

Ans) The formula of efficiency is:

$$\text{Efficiency} = \frac{\text{out put}}{\text{in put}} \times 100$$

Q15) What is meant by the term power?

Ans) The time rate of doing work is called power.

$$\text{Power} = \frac{\text{Work}}{\text{time}}$$

Q16) Define watt -

Ans) The SI unit of power is watt. One watt is the power of a device which does 1 J of work in 1 sec.

$$1 \text{ Watt} = 1 \text{ Js}^{-1}$$