

Science For Class IX
Work and Energy

<1M>

(Q.1) <#> Kinetic energy of a moving object is the energy

- (A) Possessed by an object due to its motion
- (B) That increases with speed
- (C) Equal to the work done on it to make it acquire that velocity.
- (D) All of these

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(Q.2) <#> Negative value of work done indicates that

- (A) Force and displacement are in the same direction
- (B) More than one force is acting on the object
- (C) Displacement and force are in opposite directions
- (D) Both (2) and (3)

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(Q.3) <#> Unit of work done is

- (A) Joule
- (B) Newton meter
- (C) Calorie
- (D) Both (1) and (2)

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(Q.4) <#> Work done is defined as

- (A) Product of force and displacement
- (B) Distance through which the object is moved
- (C) Mass of the object getting displaced
- (D) Product of force and mass

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(Q.5) <#> Scientific concept of work suggest that work is said to be done if

- (A) A force acts on an object
- (B) The object must be displaced
- (C) acceleration should be there.
- (D) Only (1) and (2)

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(Q.6) <#> 1 kilowatt = -----

- (A) 1000 W
- (B) 1000 J s^{-1}
- (C) 1000 N m s^{-1}
- (D) All of these

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(Q.7) <#> Commercial Unit of power is kilowatt-hour (kW h)

- (A) $1 \text{ kW h} = 3.6 \times 10^6 \text{ J}$
- (B) 1 kW h is the energy consumed in one hour at the rate of 1000 J s^{-1}
- (C) $1 \text{ kW h} = 1 \text{ unit of electrical energy}$
- (D) All these statements are correct

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(Q.8) <#> An electrical appliance of 500 W is used for 5 hours per day. Energy consumed in 30 days will be

- (A) 2.5 kW h
- (B) 25 kW h
- (C) 75 kW h
- (D) None of these

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(Q.9) <#> What is energy of a body?

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(Q.10) <#> Define kinetic energy.

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(Q.11) <#> What is potential energy?

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(Q.12) <#> What will be the work done by a force if displacement of the body is zero?

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(Q.13) <#> When is work done on a body positive?

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(Q.14) <#> Can energy be converted from one form to another?
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(Q.15) <#> Define power.
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(Q.16) <#> What will be the new kinetic energy of a body if its speed is doubled?
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(Q.17) <#> What is the energy change involved when a battery lights a bulb?
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(Q.18) <#> Sun is said to be the ultimate source of energy. Solar energy gets transformed into
(A) Chemical energy during photosynthesis (B) Heat energy in drying food grains
(C) Electrical energy in solar cells (D) All of these
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(Q.19) <#> Various forms of energy include
(A) Mechanical Energy (B) Chemical Energy (C) Light Energy (D) All of these
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(Q.20) <#> Law of conservation of energy states that
(A) Energy can neither be created nor be destroyed
(B) Energy can only be converted from one form to the other
(C) Total energy before and after the transformation remains the same
(D) All of these
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(Q.21) <#> Work done by a force can be
(A) Only positive (B) Only negative (C) Both positive and negative (D) None of these
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(Q.22) <#> Capacity of doing work is termed as
(A) Pressure (B) Energy (C) Force (D) Displacement
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(Q.23) <#> Unit of energy is
(A) Same as the unit of work (B) Joule (C) Both (1) and (2) (D) Neither (1) nor (2)
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(Q.24) <#> Kinetic energy of a moving object can be represented mathematically as
(A) $E_k = \frac{1}{2} m v^2$ (B) $E_k = mgh$ (C) Both of these (D) None of these
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(Q.25) <#> An object of 2 kg is moving with a velocity of 5 m/s. If its velocity is doubled, the kinetic energy will become
(A) 100J (B) 25J (C) 200J (D) 2.5J
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(Q.26) <#> Potential energy of an object is the energy possessed by it by virtue of
(A) Its configuration (B) Its position (C) Its position or configuration (D) Its motion.
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(Q.27) <#> Potential energy of an object at a height h is given as
(A) $E_p = \frac{1}{2} m v^2$ (B) $E_p = mgh$ (C) $E_p = w$ (D) All of these
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(Q.28) <#> Gravitational Potential Energy of an object will
(A) Increase by increasing the path along which the object is moved
(B) Decrease by increasing the path along which the object is moved

- (C) Not affected by changing the path, provided the overall height is same
 (D) None of these
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(Q.29) <#> An object of 12 kg mass is placed at a height of _____ m, if its $E_p = 240 \text{ J}$ and $g = 10 \text{ ms}^{-2}$
 (A) 4 m (B) 2m (C) 8m (D) 1m
 <\$>

(Q.30) <#> Total mechanical energy of an object is
 (A) Potential Energy + Kinetic Energy = Constant (B) $m g h + \frac{1}{2} m v^2 = \text{constant}$
 (C) Both (1) and (2) (D) None of these
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(Q.31) <#> Rate of doing work is termed as
 (A) Force (B) Mechanical energy (C) Power (D) Momentum
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(Q.32) <#> Unit of power is
 (A) Joule (B) Watt (C) Calorie (D) Newton
 <\$>

(Q.33) <#> The potential energy of a freely falling object decreases progressively.
 (A) The law of conservation of energy is violated
 (B) Potential energy gets converted into kinetic energy progressively
 (C) Sum of Potential Energy and Kinetic Energy at any point during the free fall remains constant
 (D) Both (2) and (3)
 <\$>

(Q.34) <#> When a freely falling object hits the ground, its kinetic energy is
 (A) Converted into heat energy (B) Used to form a crater in the ground
 (C) Collides and then rebounds (D) Any of the three are possible
 <\$>

(Q.35) <#> A man X takes 60 m tall stairs to reach the top of a building and another man Y takes 55 m tall stairs to reach the top of the same building. Which of the following statement is true?
 (A) Work done by the person X is more than the work done by the person Y
 (B) Work done by the person Y is more than the work done by the person X
 (C) Work done by both of them is same
 (D) None of these
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(Q.36) <#> Two bodies of same mass have velocities in ratio 2:3. What will be the ratio of their kinetic energies?
 (A) 2 : 3 (B) 4 : 9 (C) $\sqrt{2} : \sqrt{3}$ (D) 8 : 27
 <\$>

(Q.37) <#> What type of energy transformation takes place in a battery cell?
 (A) Chemical energy into electrical energy (B) Electrical energy into chemical energy
 (C) Potential energy into electrical energy (D) Mechanical energy into electrical energy
 <\$>

(Q.38) <#> What is the unit for electrical energy?
 (A) KW (B) KWh (C) Watt (D) Js
 <\$>

(Q.39) <#> Which of the following has magnitude as well as direction?
 (A) Work (B) Force (C) Kinetic energy (D) Potential energy
 <\$>

(Q.40) <#> What type of energy transformation takes place in a cracker?
 (A) Kinetic energy into sound energy (B) Chemical energy into sound and light energy
 (C) Potential energy into sound and light energy (D) Kinetic energy into sound and light energy
 <\$>

<2M>

(Q.41) <#> A constant force of 10N displaces a body through 5 m. Find the work done by the force?
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(Q.42) <#> What will be the work done if a stone of mass 2 kg is raised through a height of 10cm?
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(Q.43) <#> What are the conditions needed for work to be done?
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(Q.44) <#> An electric bulb of 60w is used for 5 hours a day. Calculate the energy consumed in one day by the tube?
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(Q.45) <#> An object of mass 10kg is moving with speed 4 m/sec. What is the kinetic energy of the object?
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(Q.46) <#> An object of mass 10kg is at a certain height above the ground. If the potential energy of the object is 200j find the height of the object from the ground?
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(Q.47) <#> A person is holding a heavy bag on his head for 20 minutes and gets tired. Has he done some work or not? Explain.
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<3M>

(Q.48) <#> A ball of mass 2kg is kept on a tower of height 30m. Find its potential energy at this point. If it is allowed to fall freely, find its kinetic energy when it just touches the ground?
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(Q.49) <#> A body of mass 5 kg is kept on a table. If it is displaced by a force of 10N by 2 m on the table on the same horizontal line, find the work done by the gravitational force.
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(Q.50) <#> What is law of conservation of energy?
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(Q.51) <#> A man of mass 50kg climbs a tower of height 45m in 5 seconds with the help of a rope. Find the power of the man?
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(Q.52) <#> If a particle falls through a height; its potential energy decreases. Does this violate the law of conservation of energy? Explain why?
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(Q.53) <#> What is the work done by the force of gravity on a satellite moving round the earth?
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(Q.54) <#> What will be the work done to stop a moving cycle of mass 30kg which is moving with speed 54km/hr ?
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(Q.55) <#> A freely falling body stops when it hits the ground. What happens to its kinetic energy?
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<5M>

(Q.56) <#> If in an office, 10 tubes of 40W, 5 fans of 75W and 2 ACs of 1500W are used for 8 hours a day. Calculate the energy consumed per day in commercial units of energy.
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(Q.57) <#> Prove that the kinetic energy of a body moving with speed v is equal to $\frac{1}{2}mv^2$
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(Q.58) <#> What will be the work done to increase the speed of a bike from 18km/h to 54 km/hr if the mass of the car is 100kg?
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