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Solution 1
Mass = m
Height above the ground = h
Work done = Potential energy acquired by the body = m x g x h
where g is acceleration due to gravity
Solution 2
SI unit of work is Joule (J).
Solution 3
Work is a scalar quantity.
Work, as a physical quantity, requires only magnitude to be represented. Hence, it is scalar quantity.
Solution 4
When a force of 1 newton moves a body through a distance of 1 metre in its own direction, then the work done is known as 1 joule.
Solution 5
The condition for a force to do work on a body is that it should produce motion in the body.
Solution 6
Energy is a scalar quantity. It has only magnitude but no direction.
Solution 7
a)Unit of work is joule.
b) Unit of energy is joule.
Solution 8
The work done against gravity is zero when a body is moved horizontally along a frictionless surface because force of gravity acts perpendicular to the direction of motion.
Solution 9
Kinetic energy will become four times when the speed is doubled because kinetic
energy is directly proportional to square of speed of the body
$K.E \propto V^2$
Solution 10
Mass = m
Velocity = v

Mass = m
Velocity = v

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

Solution 11

Kinetic energy will become one-fourth when the speed is halved because kinetic energy is directly proportional to square of speed of the body

K.E $\propto V^2$

Solution 12

The kinetic energy of a body depends on

a) Mass of the body, m

b) Square of the velocity of the body, v^2

Solution 13

Doubling the velocity would have a greater effect on kinetic energy.

Solution 14

Mass = 50 kg

Kinetic energy = 625 J

$$K.E. = \frac{1}{2} mv^2$$

$$625 = \frac{1}{2} \times 50 \times v^2$$

$$v = \sqrt{\frac{625 \times 2}{50}} = 5 \text{ m/s}$$

Solution 15

a) Both kinetic and potential energy

b) Both kinetic and potential energy

c) Only kinetic energy

d) Only potential energy

e) Only potential energy

Note: In all the above cases we take ground as reference level where potential energy is zero.

Solution 16

Let masses of body A and B be m

Height of body A = h

Height of body B = 2h

Potential energy for body A, $PE_A = m \times g \times h$

Potential energy for body B, $PE_B = m \times g \times 2h$

$$\text{Ratio} = PE_A : PE_B = \frac{m \times g \times h}{m \times g \times 2h} = \frac{1}{2}$$

Solution 17

Mass = 1 kg

Velocity = 2 m/s

Mass = 1 kg

Velocity = 2 m/s

$$K.E. = \frac{1}{2} m \times v^2 = \frac{1}{2} \times 1 \times 2^2 = 2 J$$

Solution 18
Potential energy is a scalar quantity as it has magnitude only and it does not require any specification of direction.
Solution 19
Mass = 100 kg
Height = 5 m
$g = 9.8 m/s^2$
P.E. = m x g x h = 100 x 5 x 9.8 = 4900 J
Work done is equal to PE acquired by the body.
Solution 20
False.
PE = m x g x h
= 1 x 9.8 x 1 = 9.8 J
Solution 21
The potential energy is doubled when the height is doubled since potential energy is directly proportional to height, h to which body is raised.
PE $\propto$ h
Solution 22
a) Potential energy
b) Kinetic energy
c) Potential energy
d) Potential energy
e) Potential energy
Solution 23
a) Force ; distance
b) Zero
c) newton; metre; force
d) Energy; kinetic energy
e) mechanical
Solution 24
The work done by a force on a body depends on two factors
a) magnitude of force
b) distance through which the body moves
Work done is directly proportional to the force applied and the distance through which the body moves.
W = F x s
where W is work done, F is force applied and s is distance through which the body moves.
Solution 25
Yes, it is possible that a force is acting on a body but still work done is zero. For example, in the case of a man pushing a wall, the work done is zero despite of non-zero force, sin ce there is no displacement of the wall.

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