

Work, Energy and PowerVery Short Answer Questions:

1. What is the significance of the -ve sign in $W = -mgh$?
2. A man raises a mass m to a height ' h ' and then shifts it horizontally by a length ' x '. What is the work done against the force of gravity?
3. Is friction a conservative force? Give reason.
4. Give the conditions under which a force is called conservative force.
5. Relate 1 KWh with 1 Joule.
6. What is the unit for spring constant?
7. A mass m collides with another mass $2m$ and sticks to it. What is the nature of the collision?
8. Two equal masses, one at rest and another moving undergo one dimensional elastic collision, what are their velocities after collision?
9. How many ergs make one joule?
10. A mass is moving in a circular path with constant speed. What is the work done in $3/4$ th of a rotation?
11. Two bodies m_1 and m_2 ($m_1 > m_2$) have equal kinetic energies. Which will have more momentum?
12. Ten identical balls are placed in contact on a smooth surface. If the eleventh identical ball moving with a speed ' u ' collides on the first, what will you notice?

13. Is it necessary to do work to maintain a constant velocity with a body in a rough surface?
14. Does the work done in raising a box on to a platform depends upon how fast it is raised up? If not why?
15. A man rowing boat upstream is at rest w.r.t. the shore, is he doing work?
16. The earth moving round the sun in circular orbit is acted upon by a force and hence work must be done on the earth by the force. Explain.
17. A light body and a heavy body have the same momentum. Which one will have greater K.E.?
18. Is it possible to have a situation when $E-U < 0$?
19. Can mechanical energy be negative?
20. A spring is cut into two equal halves. How is spring constant of each half affected?

Short Answer Questions

1. Draw the variation of P.E. stored in a spring as a function of extension.
2. Is it possible to have a collision in which all K.E. is lost? Give example.
3. If one of the two colliding particles is initially at rest, is it possible for both of the particles to be at rest after collision?
4. How are fast neutrons slowed down with the use of moderators?
5. When a spring experiences a force $F = +kx$. Find the work done in stretching by x ?
6. What is the work to be done to stretch the spring to $2x$ from x ? Given the spring constant is k .
7. A shell explodes while at rest. Discuss the momentum and energy conservation in the explosion.
8. Define instantaneous power. Give S.I. units.
9. State and prove work-energy theorem.
10. What is the meaning of term collision in Physics. What is the importance of collision phenomenon?
11. An aeroplane's velocity is doubled. What happens to its momentum and K.E.?
12. A particle of mass ' m ' is moving in a horizontal circle of radius ' r ' under a centripetal force equal to $-k/r^2$, where k is a constant. What is the total energy of particle?
13. What happens when a light sphere collides head on with a more massive sphere initially at rest?

14. Can a body have energy without having momentum and have momentum without having energy? Explain.
15. Define power. Obtain an expression for it in terms of force and velocity.
16. Define the term watt, and Kilo-watt hour.
17. A stone is dropped from a height 'h', prove that the energy at any point in its path is mgh .
18. Define K.E. and derive an expression for it.
19. What is an elastic collision? What will happen, when a light body collides on a heavy mass at rest.
20. Two protons are brought towards each other. Will the P.E. of the system decrease or increase? Explain.