

# Energy

**1. When it is called work is done.**

Ans. Work is done when a force is applied on an object and moves it in the direction of the force.

\*\* If the applied force doesn't produce movement there is no work done.

**2. Why "Energy and Work are equivalent, can be converted from one to the other", describe with example.**

Ans. When we wind up the spring in a toy, we use our body energy to do the mechanical work of winding the spring. The work is now stored as energy in the spring. When the spring uncoils, the stored energy is converted to work as movement of the toy. Thus, Energy and Work are equivalent, can be converted from one to the other.

Energy  $\longleftrightarrow$  Work

**3. When energy of an object is increased and decreased. Describe with example.**

Ans. When work is done on an object, the energy of the object increases.

Example: When we hit a tennis ball, its energy increases and it moves.

When work is done by an object, its energy is used up and thus decreases.

Example: When we hit a tennis ball Our body has to do work, and thus our energy decreases.

Thus, Energy and Work are equivalent, can be converted from one to the other.

**4. What is Mechanical Energy?**

Ans. Mechanical Energy is the energy possessed by an object due to its motion position or both.

**5. What is 1 Joule?**

Ans. When a force of 1 N is applied on an object and it produces a displacement of 1 m in the direction of force, the work done is 1 Joule (J)

$$1 \text{ J} = 1 \text{ N} \times 1 \text{ m}$$

**6. What is one Calorie?**

Ans. 1 Calorie is the energy required to raise the temperature of 1 gm of water by 1°C.

$$1 \text{ Cal} = 4.2 \text{ J}$$

**7. Mechanical Energy is how many types?**

Ans. Mechanical Energy is 2 types:

- a. Kinetic Energy
- b. Potential Energy.

**8. Define Kinetic Energy.**

Ans. Kinetic Energy is the energy possessed by moving objects.

It is a type of mechanical energy

Example: A moving bus, A moving ball etc.

**9. What is the Numerical expression of Kinetic Energy?**

Ans.  $KE = \frac{1}{2} \times m \times v^2$

Where m= Mass of an object

V= Velocity of the object

**10. What is Potential Energy?**

Ans. Potential Energy is the energy possessed by an object due to its position or condition.

Example: A stone raised from the ground has potential energy due to its height above the ground. This is known as Gravitational Potential Energy.

**11. What is the Numerical expression of Potential Energy?**

Ans.  $PE = m \times g \times h$

Where m= Mass of an object

G= Gravitational Energy

h= Height from the ground.

**12. Give an example of Elastic Potential Energy?**

Ans. When a spring is stretched, it tries to go back to its original shape when released. This is due to Elastic Potential Energy.

**13. What is Electrical Energy?**

Ans. Electric current is the flow of charges through a wire. The energy possessed by an electric current is known as Electrical energy.

**14. What is Chemical Energy?**

Ans. Chemical Energy is the energy possessed by substances that can be released by chemical reaction.

**15. What is Magnetic Energy?**

Ans. When two magnets or a magnet or a magnet and a piece of iron close to each other, they both acquire a potential energy. This is called magnetic Energy.

**16. What is Nuclear Energy?**

Ans Atoms have a very small central region called Nucleus, which has particles called electrons that revolve around it. Nucleus contains Proton and Neutron. They are tightly bond in the nucleus by an energy called Nucleus Energy. A part of the binding energy is released if a nucleus split. This is known as Nucleus Fission.

**17. What is Conversion of Energy?**

Ans. Whenever energy is used to do some work, it changes from one form to another. This is known as Conversion of Energy or Transformation of Energy.

Example: A car engine converts the chemical energy of petrol into heat energy and then into the kinetic energy of the wheels.

**18. What are Laws of Conservation?**

Ans. Laws of Energy states that Energy can neither be created nor be destroyed. But can change from one form to another.

**19. What is Energy Auditor?**

Ans. An energy auditor is an specialist who conducts energy assessments of homes, offices and factories and recements way to reduce energy usage.

**20. How Roller Coaster moves, explain with the help of Conservation of Energy.**

Ans. In a roller coaster when the car is climbing up a curve the potential energy increases and the kinetic energy decreases. At the highest point the car moves slowly and hence its kinetic energy is at its least. But since the highest is maximum so is the car's potential energy.

When the car is climbing down the potential energy keeps reducing until it reaches zero value at the lowest point of the curve, the kinetic energy increases and the maximum value at the lowest point as the car is moving at the fastest speed.

Device	Energy conversion
washing machine, juicer	electrical energy into mechanical energy
electric fan	electrical energy into mechanical energy
bicycle dynamo, generator	mechanical energy into electrical energy
microphone	sound energy into electrical energy
loudspeaker	electrical energy into sound energy
doorbell	electrical energy into sound energy
electric motor	electrical energy into mechanical energy
solar cell	light energy into electrical energy
flashlight	chemical energy into electrical energy and then into light energy