

# WORK AND ENERGY

# 6

## KIPS MULTIPLE CHOICE QUESTIONS

- Product of force and distance covered in the direction of force is:**  
a) Acceleration      b) Resistance      c) Work      d) Specific heat
- For work ----- conditions should be fulfilled:**  
a) 1      b) 2      c) 3      d) 4
- Work is ----- quantity:**  
a) Scalar      b) Vector      c) Base      d) None of above
- Unit of work is:**  
a) N      b) Nm      c) J      d) Both b & c
- Work done will be ----- if no force act on the body:**  
a) Maximum      b) Minimum      c) Zero      d) All of above
- Work done will be maximum if displacement is ----- to force:**  
a) Parallel      b) Perpendicular      c) Tangent      d) Normal
- Work done will be zero if displacement is ----- to force:**  
a) Parallel      b) Perpendicular      c) Tangent      d) Normal
- Work done will be one ----- if a force of one Newton acts on the body and it covers the distance of 1 meter in the direction of force:**  
a) Watt      b) Joule      c) Newton      d) Coulomb
- One Mega joule is equal to:**  
a)  $10^6$  J      b)  $10^3$  J      c)  $10^9$  J      d)  $10^2$  J
- What will be the magnitude of work if a force of 25 N pulls a stone through a distance of 5 m in its direction:**  
a) 25 J      b) 50 J      c) 75 J      d) 125 J
- Which unit is equal to  $\text{kgm}^2\text{s}^{-2}$  in the units given below:**  
a) Joule      b) Newton      c) Watt      d) Meter
- Rate of doing work with respect to time is known as:**  
a) Energy      b) Power      c) Momentum      d) None of above
- Unit of power is:**  
a) Watt      b) Joule      c) Newton      d) Coulomb
- How much power is used by a 40 kg athlete by climbing 10m high ladder in 10 s:**  
a) 4 W      b) 40 W      c) 400 W      d) 4000 W
- What will be the power of a machine doing 10 J work in 5 seconds?**  
a) 2 W      b) 10 W      c) 25 W      d) 50 W

16. Ability of a body to do work is known as:  
 a) Force                      b) Momentum                      c) Power                      d) Energy
17. There are ----- basic kinds of energy:  
 a) 1                      b) 2                      c) 3                      d) 4
18. Energy is ----- quantity:  
 a) Vector                      b) Scalar                      c) Base                      d) None of above
19. Unit of Energy in System International is:  
 a) Watt                      b) Joule                      c) Newton                      d) Coulomb
20. Energy possessed by a body due to its motion is called ----- energy:  
 a) Kinetic                      b) Potential                      c) Mechanical                      d) All of above
21. A bowler during playing cricket throws a ball of mass 200 g with a velocity of  $20 \text{ ms}^{-1}$ . Its kinetic energy will be:  
 a) 4 J                      b) 40 J                      c) 400 J                      d) 4000 J
22. What will be the kinetic energy of a body if its velocity is doubled?  
 a) Doubled                      b) Four times                      c) Eight times                      d) Half
23. What will be the kinetic energy of a body if its mass is doubled?  
 a) Doubled                      b) Four times                      c) Eight times                      d) Half
24. What will be the kinetic energy of a car of mass 1000 kg moving with a velocity of  $20 \text{ ms}^{-1}$ ?  
 a)  $2 \times 10^2 \text{ J}$                       b)  $2 \times 10^3 \text{ J}$                       c)  $2 \times 10^5 \text{ J}$                       d)  $2 \times 10^7 \text{ J}$
25. Ability of a body to do work due to its position is called ----- energy:  
 a) Kinetic                      b) Potential                      c) Mechanical                      d) All of above
26. Ability of a body to do work due to its height from the surface of earth is called ----- energy:  
 a) Gravitational Potential                      b) Elastic Potential  
 c) Chemical Potential                      d) Attraction
27. When a ball is lifted to a height 'h' from the ground, it will possess ----- energy:  
 a) Kinetic                      b) Gravitational potential  
 c) Elastic potential                      d) Mechanical
28. Total energy of the system:  
 a) Increases                      b) Decreases                      c) Remains same                      d) All of above
29. For movement of our body ----- energy is used:  
 a) Heat                      b) Electrical                      c) Chemical                      d) Mechanical
30. For making body molecules ----- energy is used:  
 a) Heat                      b) Electrical                      c) Chemical                      d) Mechanical
31. For the propagation of signals in our body ----- energy is used:  
 a) Heat                      b) Electrical                      c) Chemical                      d) Mechanical

32. For maintaining the body temperature ----- energy is used:  
 a) Heat                      b) Electrical                      c) Chemical                      d) Mechanical
33. Increase in K.E is equal to:  
 a) Increase in P.E                      b) Decrease in P.E                      c) No effect                      d) Both a & b
34. Increase in P.E is equal to:  
 a) Increase in K.E                      b) Decrease in K.E                      c) No effect                      d) Both a & b
35. Decrease in K.E is equal to:  
 a) Increase in P.E                      b) Decrease in P.E                      c) No effect                      d) Both a & b
36. Decrease in P.E is equal to:  
 a) Increase in K.E                      b) Decrease in K.E                      c) No effect                      d) Both a & b
37. A motor lift a weight of 5N up to the height of 2m in 4s. What will be the power of the motor?  
 a) 2.5 W                      b) 5 W                      c) 20 W                      d) 10 W
38. Energy of the water stored in the dam is:  
 a) Elastic potential energy                      b) Gravitational potential energy  
 c) Kinetic energy                      d) Mechanical energy
39. How many types of mechanical energy are?  
 a) 1                      b) 2                      c) 3                      d) 4

### ANSWER KEY

Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans
1	c	11	a	21	b	31	b
2	b	12	b	22	b	32	a
3	a	13	a	23	a	33	b
4	d	14	c	24	c	34	b
5	c	15	a	25	b	35	a
6	a	16	d	26	a	36	a
7	b	17	b	27	b	37	a
8	b	18	b	28	c	38	b
9	a	19	b	29	d	39	b
10	d	20	a	30	c		

## KIPS SHORT QUESTIONS

**Q.1 Define work and its unit.**

**Ans: Definition**

Work is done when force acting on a body displaces it in the direction of a force.

**OR**

The product of force and distance covered in the direction of force is equal to the work done.

**Unit of work**

In System International, its unit is joule (J).

**Joule**

"The amount of Work done will be one joule if a force of one Newton displaces a body through a distance of one meter in the direction of the force."

**Q.2 Define Energy and write down its unit.**

**Ans: A body possesses energy if it is capable to do work.**

**OR**

Ability of a body to do work is known as energy.

**Quantity**

It is a scalar quantity

**Unit**

Joule is the unit of energy same as that of work.

**Types of Energy**

Energy exists in various forms such as mechanical energy, heat energy, light energy, sound energy, electrical energy, chemical energy and nuclear energy etc.

**Types of Mechanical Energy**

Mechanical energy possessed by a body is of two types:

- (i) Kinetic Energy
- (ii) Potential Energy

**Q.3 Define kinetic energy and give at least one example.**

**Ans: "The energy possessed by a body due to its motion is called kinetic energy"**

**Example**

- Moving water in a river can carry wooden logs through large distances and can also be used to drive turbines for generating electricity.

**Q.4 Define Potential Energy and give examples.**

**Ans: The energy possessed by a body due to its position is known as its potential energy.**

**Examples**

- Stored water in dam
- A hammer is raised up to some height has the ability to do work
- A stretched bow has potential energy due to its stretched

**Q.5 Define Gravitational Potential Energy and give at least one example.**

**Ans: The energy present in a body due to its height is called gravitational potential energy.**

**Example**

- Stored water in dam
- Energy of a stone lying on the roof

**Q.6 Define Efficiency.**

**Ans: Efficiency of a system is the ratio of required form of energy obtained from a system as output to the total energy given to it as input.**

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**Q.7 What do you know about Ideal machine?**

**Ans:** An ideal machine is that which gives an output equal to the total energy used by it. In other words, its efficiency is 100 %. People have tried to design a working system that would be 100% efficient. But practically such system does not exist.

**Q.8 Can we say that practical systems can be 100% efficient?**

**Ans:** Every system meets energy losses due to friction that causes heat, noise etc. these are not the useful forms of energy and go waste. This means we cannot utilize all the energy given to working system. The energy in the required form obtained from working system always less than the energy given to it as input.

**Q.9 Define Power. Write down its unit and define it.**

**Ans:** "Rate of doing work with respect to time is called the power."

**Unit of power**

In System International, the unit of power is watt (W).

**Watt**

"If a body does a work of one joule in one second then its power will be one watt".

**Q.10 Do we do any work when we lift a load from the Earth to some height?**

**Ans:** Yes, we do work when we lift a load from the earth to some height because we have to do work against the gravitational pull of the earth. Mathematically, it can be expressed as,

As we know that  $W = FS$

As  $F = mg$  and  $S = h$

So the work done is  $W = mgh$

**Q.11 How much power is used by a 40 kg athlete by climbing 10m high ladder in 10s?**

**Ans:**

We have Mass =  $m = 40$  kg

Time =  $t = 10$  s

Height =  $h = S = 10$  m

As we know that Force = weight =  $w = mg = 40 \times 10 = 400$ N

Work =  $W = FS = 400 \times 10 = 4000$  J

As we know that Power =  $P = W/t$

So, Power =  $P = 4000/10 = 400$  W

**Q.12 Give some examples of energies used in our body?**

**Ans:** There are many kinds of energies are used in our body. Some of them are given below:

**Mechanical Energy**

For the moving of our body.

**Chemical Energy**

For making body molecules.

**Electrical Energy**

For the propagation of electrical signals in the body.

**Heat Energy**

For maintaining the body temperature.

**Q.13 How much work is done when a body moves with uniform velocity?**

**Ans:** When a body moves with uniform velocity means moving with zero acceleration then work done will be zero because according to Newton's second law of motion if  $a = 0$  then the net resultant force acting on the body is zero.

As we know that  $W = FS$

If  $F = 0$  then  $W = 0 \times S = 0$

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