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THE DEGREE OF DOCTOR OF PHILOSOPHY IN COM

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2Ao State the changes in form of energy while producing hydro electricity.

Ans The waters in motion in a river or sea has the kinetic energy. The energy possessed by the flowing water is called the hydro energy ais to produce electricity.

Q22. Give one example to show that the sum of potential energy and kinetic energy remains constant if friction is ignored.

Ans> During the vertical fall of ball, if ~~friction~~ friction due to air is neglected, the total sum of potential energy and kinetic energy at each point of its path remains same.

Q23. A ball is made to fall freely from a height. State the kind/kinds of energy possessed by the ball

(a) at the highest point

(b) Just in the middle

(c) At the ground

Ans> (a) Potential energy

b. Potential energy

(c) Kinetic energy

Ans) In an electric heater, oven, geyser, toaster etc. The electrical energy into heat energy.

(ii) An electric generator
(iii) Tube light of bulbs
(iv) Burning of wood, coal etc
(v) Fire crackers burst

Q21. What do you mean by conservation of mechanical energy? State the condition when does it hold.

Ans) This means "The total mechanical energy (P.E + K.E) of an isolated system at any instant is equal to the sum of kinetic energy and the potential energy.

condition- condition under which the mechanical energy is conversed is" when there are no frictional forces". In other words the mechanical energy is conserved strictly in vacuum where friction due to air is absent.

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20 In an electric motor (ore in fan) the electrical energy changes into the mechanical energy. This energy rotates the axle of motor (or the blades of the fan).

220. Give one relevant example for each of the following transformation of energy:

i) Electrical energy to heat energy

ii) Electrical energy to mechanical energy.

iii) Electrical energy to light energy.

iv) Chemical energy to heat energy.

v) Chemical energy to light energy.

(iv) Electrical energy change into mechanical energy.

Q19. Energy can exist in several forms and may change ~~from~~ from one forms to another. Give two examples to show the conversion of energy from one form to another.

Ans- The examples that show the conversion of energy from one to form another are:

(i) In a steam engine, the chemical energy of the coal first changes into the heat energy ~~of the coal first changes~~ of the steam. Then heat energy of steams changes into the mechanical energy which makes the train to move.

acid makes the nail to move into the wood.

Q18. State the energy changes that occurs in the following:

(i) The unwinding of a watch spring.

(ii) Burning coal while operating a stream engine.

(iii) Lighting of a torch bulb.

(iv) An electric generator (or dynamo)

Ans:- (i) Potential energy to kinetic energy.

(ii) chemical energy of coal changes to heat energy to the stream. Heat energy changes into mechanical energy.

(iii) Chemical energy into light and heat energy.

Ans:- The example to show the conversion of potential energy to kinectic energy when put in use is: A stone at a height has a potential energy due to its lifted or raised position. In the figure below when the stone is dropped from that position, it begins to fall. The falling stone has the kinetic energy. Thus the potential energy stored in the stone in its raised position changes into the kinetic energy when the stone is falling. This kinetic energy does work on the nail as the stone strikes the nail

(v) A bullet fired from a gun.

(vi) water flowing in a river.

(vii) A stretched rubber band.

Ans (i) kinetic energy

(ii) Potential energy

(iii) Potential energy

(iv) kinetic energy

(v) kinetic energy

(vi) Potential energy

(vii) Potential energy

Q17. Give one example to show the conversion of potential energy to kinetic energy when put in use.

Ans: Yes a body possess energy even when it is not in motion:

consider a body raised to a certain height day h. If its velocity is zero kinetic energy will be zero but the body will have.

P.E = mgh

Thus, a body may possess energy even through it is not in motion.

Q16. Name the type of energy (kinetic or potential) possessed by the following:

(i) A moving cricket ball

(ii) A stone at rest on the top of a building

(iii) A compressed spring

(iv) A moving bus

Ans:- A wound up watch spring has the potential energy because of its wound up state. As the spring balanced

A wound up watch spring has the potential energy because of its wound up state. As the spring unwinds itself, the potential energy changes into kinetic energy. This kinetic energy does work in moving the arms of the watch

15. Can a body posses energy even when it is not in motion? Explain your answer with an example.

Ans:- Yes, a body posses energy even when it is not in motion.

Ans: The toy car 'A' of mass '500 gm' has the greater kinetic energy, This can be explained as:

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

Here, the both the cars are moving with same speed. So the cars with greater mass will possess greater kinetic energy.

Q13. A cyclist doubles his speed. How will his kinetic energy change: increases, decreases or remain same?

Ans: When a cyclist doubles his speed. His kinetic energy increases four times.

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

When v = doubles the K.E. quadruples.

Q14. Name the form of energy which a ~~wound~~ wound up watch spring posses.

Actually, it is the work done on the body bringing it to the state of motion. In short form it is written as K.E or K

Examples- In a swinging pendulum moving to and fro, the bob has the kinetic energy.

Q11. State two factors on which the kinetic energy of a moving body depends.

Ans The kinetic energy of a moving body depends on the following two factors:

(a) The mass of the body - Greater the mass of the body, higher is its kinetic energy.

(b) The speed of the body - More the speed of the body, higher is its kinetic energy.

12. Two toys - cars A and B of masses 500 g and 200 g respectively are moving with the same speed which of the two has the greater kinetic energy?

9. A bucket full of water is on the first floor of your house another identical bucket with same quantity of water is kept on the second floor. Which of the two has greater potential energy?

Ans: A bucket full of water kept on second floor has the greater potential energy. This can be followed

P.E. = mgh

mass of both bucket and the gravitional force are same. So the body at greater height will possess more potential energy.

10. Define kinetic energy. Give one example of a body which possesses kinetic energy.

Ans: The energy of a body in motion is called its kinetic energy. It is defined as follows:

Kinetic energy of a body is the energy possessed by it due to its state of motion.

depends upon the following two factors :-

a) The mass of the body :- Greater the mass of the body, greater is the potential energy of the body.

b) Its height above the ground :- ~~Higher~~ Higher the height of the body, greater is its potential.

8. Two bodies A and B of masses 10 kg and 20kg respectively are at the same height above the ground which of the two has a greater potential energy ?

Ans The body B having mass 20 kg has the greater potential energy. This can be explained as follows :-

P.E. = mgh

For both the bodies gravity and height are same so the body with greater mass possesses greater

(ii) Due to its position

Ans:- (i) potential energy of a body is the energy ~~for~~ possessed by it due to its of rest or position. It is the energy stored when work is done on the body to bring it to that state or position.

(ii) potential energy of a body in the raised (or lifted) ~~for~~ position depends on two factors : (1) The mass of the body greater the mass of the body, greater is the potential energy of the body), and (2) the height of the body above the ground (greater the height of the body, greater is its potential energy.)

7. State two factores on which the potential energy of a body at a certain height above the ground depends.

Ans:- The potential energy of a body in the raised

4. What are the two kinds of mechanical energy.

Ans: The mechanical energy have two kinds they are:

i) Potential energy

ii) Kinetic energy

5. What is potential energy? State its unit.

Ans: The energy of a body at rest is called the potential energy. It is defined as follows:

Potential energy of a body is the energy possessed by it due to its state of rest or position. Actually it is work spent in bringing the body to that state of rest or position.

It is written as P.E. or U

The S.I. unit of potential energy is joules.

6. Give one example of a body that has potential energy in each of the following is due to its state

(Symbol J)

A body is said to possess an energy of one joule if a force of 1 newtone moves the body by a distance of 1 metre in the direction of force.

Another unit of energy is calorie (Symbol cal) where 1 cal = 4.2 J. A bigger unit is kilo-calorie (Symbol kcal) where 1 kcal = 1000 cal.

3. Name five different forms of energy.

Ans:- The different forms of energy are:

1. electrical energy
2. Heat energy
3. mechanical energy
4. Atomic energy
5. Chemical energy
6. Potential energy
7. kinetic energy
8. Sound energy

c. The energy stored in an electric cell is

Ans:- chemical energy.

d. When a bulb lights up on passing current, the change of energy is

Ans:- from electrical energy to heat and light energy.

e. The correct statement is

Ans:- Both work and energy have the same units.

f. According to law of conversation of energy, energy changes from one form to another form, but the total energy of that system

Ans:- remains the same.

B. Short / long Answer questions

1. Define the term energy

Ans:- Energy is the capacity of doing work.

2. State the unit of energy and define it.

Ans:- The energy is measured in the same unit as work. Therefore the S.I. unit of energy is Joule

multistorey building has potential energy and kinetic energy when halfway down the building.

3. Match the following question columns

	Column A	Column B
(a)	Running water	kinetic energy
(b)	Burning	heat energy
(c)	Energy	joule
(d)	Sound energy	vibrations
(e)	Nuclear energy	atom bomb

4. Select the correct alternatives

(a) when we rub our hands

Ans. mechanical energy changes into heat energy.

b. A ball moving on the ground possesses

Ans. kinetic energy.

8.

Fill in the blanks

2. a) An electric fan converts electrical energy into mechanical energy.

b) cooking gas converts chemical energy into heat energy.

c) Energy possessed by a compressed spring is potential energy.

d) The ability to do work is called energy.

e) The energy possessed by a body due to its position is called potential energy.

f) The energy possessed by a body due to its motion is called kinetic energy.

g) Green plants converts light energy into chemical energy.

h) The S.I unit of energy is joule.

i) An object falling freely from the roof of a

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objective questions

1. Write True or false for each statement

(a) A man going up has potential energy and kinetic energy. (T)

(b) A gum bottle lying on a table has no energy. (F)

(c) An an electric fan, electrical energy changes into mechanical energy. (T)

(d) Potential energy changes into kinetic energy when it is put to use. (T)

(e) one form of energy cannot be converted into another form. (F).

f. There is always some loss of energy in conversion from one form of energy to another form, so the total energy is not conserved. (F)

g. The energy of flowing water can be converted into electric energy (electricity). (T)