Chapter-3

ENERGY

Q1) Write true or false for each statement:

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

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

(c) in an electric fan, electrical energy changes into the mechanical energy.

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

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

(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.

(g) the energy of flowing water can be converted into electric energy .

Q2) Fill in the blanks

(a) An electric fan converts electrical energy into _____ energy .

(b) Cooking gas converts _____ energy into heat energy.

(c) Energy possessed by a compressed spring is _____ energy.

(d) The ability to do work is called _____ .

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

(f) The energy possessed by a body due to its movement is called _____ energy

(g) Green plants convert _____ energy into chemical energy.

(h) The S.I. The unit of energy is _____ .

(i) An object falling freely from the roof of a multi-storey building has _____ and _____ energy when halfway down a building.

Q3) Match the following:

Column A	**Column B**
(a) running water	(i) energy
(b) burning	(ii) vibrations
(c) energy	(iii) atom bomb
(d) sound energy	(iv) kinetic energy
(e) nuclear energy	(v) joule

Q4) Select the correct alternative:

(a) When we rub our hands

1. kinetic energy changes into potential energy
2. mechanical energy changes into heat energy
3. potential energy changes into kinetic energy
4. heat energy changes into mechanical energy.

(b) A ball rolling on the ground possesses

1. kinectic energy
2. potential energy
3. no energy
4. heat energy

(c) The energy stored in an electric cell is

1. chemical energy
2. electrical energy
3. heat energy
4. mechanical energy

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

1. from electrical energy to heat energy
2. from electrical energy to light energy
3. from electrical energy to heat and light energy
4. from electrical energy to mechanical energy

(e) The correct statement is

1. Both work and energy have the same units.
2. Potential energy of a body is due to its motion.
3. Kinetic energy of a body is due to its position or state.
4. Kinetic energy can change into potential energy , but potential energy cannot change into kinetic energy.

(f) According to law of conservation of energy, energy changes from one form to another form, but the total energy of that system

1. increases
2. decreases
3. alternates
4. remains the same

Q5. Choose the correct option:

1. The unit of work is joule. The other physical quantity that has same unit is
(a) power (b) velocity (c) energy (d) force

2. The spring will have maximum potential energy when
(a) it is pulled out (b) it is compressed
(c) both (a) and (b) (d) neither (a) nor (b)

3. The energy possessed by an oscillating pendulum of a clock is
(a) kinetic energy (b) potential energy
(c) restoring energy. (d) mechanical energy

4. The gravitational potential energy of an object is due to
(a) its mass
(b) its acceleration due to gravity
(c) its height above the earths surface
(d) all of the above.

5. A ball is dropped from a height of 10 m.
(a) Its potential energy increases and kinetic energy decreases during the falls
(b) Its potential energy is equal to the kinetic energy during the fall.
(c) The potential energy decreases and the kinetic energy increases during the fall.
(d) The potential energy is 0 and kinetic energy is maximum while it is falling.

6. If the velocity of a body is doubled its kinetic energy
(a) gets doubled (b) becomes half
(c) does not change (d) becomes 4 times

Short answer type questions

1. Define energy.
2. When a work is said to be done?
3. State and define S.I. unit of work done.
4. How work and energy are related?
5. State and define S.I. unit of energy.
6. Define mechanical energy.
7. Define chemical energy.
8. Define nuclear energy.
9. What is dissipation of energy?
10. State the law of conservation of energy.

_____ 11. Define elastic potential energy.
12. Define gravitational potential energy.

Short/long Answer type questions

1) Derive the formula for potential energy.
2) Explain the Law of conservation of energy with pendulum.
3) If energy is neither created nor destroyed, then from where do we get energy?
4) State and explain one example where kinetic energy is present in a body and is used.
5) What is potential energy? Explain different types of potential energy.
6) How is work and energy related to each other?
7) Give one example where work done on an object is negative.
8) Give one example where work done on an object is zero.
9) Differentiate between potential energy and kinetic energy.
10) State and explain one example where (i) Kinetic energy is present in a body and is used; and (ii) Potential energy is present in a body is used.

Short/long Answer type questions(HOTS)

Q1) Define the term energy.

Q2) State the unit of energy and define it.

Q3) Name the different forms of energy .

Q4) What are the two kinds of mechanical energy ?

Q5) What is potential energy? State its unit.

Q6) Give one example of a body that has potential energy, in each of the following: (i) due to its position, (ii) due to its state.

Q7) State two factors on which the potential energy of a body at a certain height above the ground depends.

Q8) Two bodies A and B of masses 10kg and 20kg respectively are at the same

height above the ground. Which of the two has the greater potential energy?

Q9) A bucket full of water is on the first floor of your house and another identical bucket with the same quantity of water is kept on the second floor. Which of the two has greater potential energy?

Q10) Define the term kinetic energy. Give one example of a body which possesses kinetic energy.

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

Q12) Two toy-car A and B of masses 500g and 200g respectively are moving at the same speed. Which of the two has the greater kinetic energy?

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

Q14) Name the form of energy which a wound up watch spring possess.

Q15) Can a body possess energy even when it is not in motion? Explain your answer with an example.

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 the building (iii) a compressed spring (iv) a moving bus (v) a bullet fired from a gun (vi) water flowing in a river (vii) a stretched rubber band

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

Q18) State the energy changes that occur in the following:

(i) the unwinding of a watch spring. (ii) burning coal while operating a steam engine. (iii) lighting of a torch bulb. (iv) an electric generator (or dynamo).

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

Q20) 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.

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

Q23) A ball is made to fall freely from a height. State the kind/ kinds of energy possessed by the ball when it is (a) at the highest point (b) just in the middle (c) at the ground

Q24) State the changes in form of energy while producing hydroelectricity.