



Time : 1 hour 30 Minute

STD 9 Science
Chapter Based Test

Total Marks : 50

section A*** Choose the correct option from the given options****[7]**

1. Does the Law of Conservation of energy apply to machines?
(A) No, as machines require a constant input of energy in order to work
(B) Yes, the energy required to maintain motion is balanced by the energy lost to friction
(C) Yes, but only to perpetual motion machines
(D) No, as the law would apply to only perpetual motion machines
2. Which of the following does not have potential energy ?
(A) An inflated balloon
(B) Water in a flowing river
(C) A fruit on the tree
(D) A spinning top
3. As the fall of the object continues, the potential energy would _____ while the kinetic energy would _____.
(A) Decrease, decrease
(B) Increase, decrease
(C) Decrease, increase
(D) Increase, increase
4. What is the unit of measurement for work?
(A) Meters
(B) Newtons
(C) m/s
(D) Joules
5. Work done by a fielder in catching a ball is:
(A) Zero
(B) Positive
(C) Negative
(D) None of these
6. Which of the following does not possess the ability to do work not because motion?
(A) A sparrow flying in the sky.
(B) A sparrow moving slowly on the ground.
(C) A sparrow in the nest on a tree.
(D) A squirrel going up a tree.
7. The device which converts mechanical energy into energy which runs our microwave oven is:
a. Electric motor.
b. Alternator.
c. Turbine.
d. Electric heater.

*** Fill in the blank with correct answer****[3]**

8. One calorie = _____ joule.
9. Both stretched spring and compressed spring have _____ energy.
10. Fill in the following blanks with suitable word:
The work done on a body moving in a circular path is _____.

*** Do as directed**

[4]

11. Name the physical quantity whose unit is watt.
12. Name the device or machines which convert:
Heat energy into kinetic energy (or mechanical energy).
13. Energy conservation law says that:
 - a. Energy can't be destroyed but can be produced.
 - b. Neither energy can be produced nor can be destroyed.
 - c. Energy can't be produced but can be destroyed.
 - d. Energy can be produced and can be destroyed
14. Define the term 'watt'.

section B

*** Answer the Questions in brief**

[10]

1. A boy throws a rubber ball vertically upwards. What type of work, positive or negative, is done:
 - a. By the force applied by the boy?
 - b. By the gravitational force of earth?
2. On what factors does the gravitational potential energy of a body depend?
3. The kinetic energy of an object of mass, m moving with a velocity of 5ms^{-1} is 25J. What will be its kinetic energy when its velocity is doubled? What will be its kinetic energy when its velocity is increased three times?
4. By how much will the kinetic energy of a body increase if its speed is doubled?
5. By how much will the kinetic energy of a body increase if its speed is doubled?

section C

*** Answer the Questions in detail**

[12]

1. What is the difference between potential energy and kinetic energy?
2. What is the meaning of the symbol kWh? What quantity does it represent?
3. If the work done by a force in moving an object through a distance of 20cm is 24.2J, what is the magnitude of the force?
4. Explain how, the total energy a swinging pendulum at any instant of time remains conserved. Illustrate your answer with the help of a labeled diagram.

section D

*** Answer the Questions in detail [5 marks each]**

[10]

1. Calculate the work done by the brakes of a car of mass 1000kg when its speed is reduced from 20m/s to 10m/s?
2. A bullet of mass 15g has a speed of 400m/s. What is its kinetic energy? If the bullet strikes a thick target and is brought to rest in 2cm, calculate the average net force acting on the bullet. What happens to the kinetic energy originally in the bullet?

* case study based question.

[4]

1. Work done by force acting on an object is equal to the magnitude of the force multiplied by the distance moved in the direction of the force. Work has only magnitude and no direction. Work done is negative when the force acts opposite to the direction of displacement. Work done is positive when the force is in the direction of displacement. The unit of work is newton-metre (N m) or joule (J).

(i) Work done is

- (a) Scalar quantity
- (b) Vector quantity
- (c) Tensor quantity
- (d) None of these

(ii) When force acts against the direction of displacement then work done will be

- (a) positive
- (b) negative
- (c) both a and b can possible
- (d) None of these

(iii) SI unit of work is

- (a) Joule(J)
- (b) Newton meter(N-m)
- (c) both a and b
- (d) None of these

(iv) You are lifting stone from floor. Work is done by the force exerted by you on the stone. The object moves upwards. The force you exerted is in the direction of displacement. However, there is the force of gravity acting on the object. Which one of these forces is doing positive work?

Which one is doing negative work?

- (v) Define 1J of work.**

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