Physics Assignment   **Class: IX**   **Oct'2024**

Chapter 10: Work and Energy

1. **MULTIPLE CHOICE QUESTIONS:**

 i.   A girl is carrying a school bag of 3 kg mass on her back and moves 200 m on a levelled road. The work done against the gravitational force will be (g =10 m/s^2)
      (a) 6000J   b) 6 J   (c) 0.6 J   (d) zero

 ii. The work done on an object does not depend upon the
      (a) displacement   (b) force applied
      (c) angle between force and displacement   (d) initial velocity of the object

2. **In each of the following questions, two statements are given- one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:**

 a) Both A and R are true, and R is correct explanation of the assertion.

 b) Both A and R are true, but R is not the correct explanation of the assertion.

 c) A is true, but R is false.

 d) Both assertion and reason are false.

   (i) **Assertion**: A velocity of an object is doubled, then its kinetic energy quadrupled.

        Reason: Kinetic energy of an object is proportional to the square of its velocity.

   (ii) **Assertion**: Water stored in a dam is utilized to produce electrical energy.

        Reason: Energy can be transformed from one form to another form.

3. **Answer the following questions:**
1. List two conditions, which need to be satisfied for the work to be done on an object.
2. Calculate the work done against the gravity.
3. Raman can run with a speed of 8 m s^{-1} against the frictional force of 10 N, and Kapil can move with a speed of 3 m s^{-1} against the frictional force of 25 N. Who is more powerful and why?
4. A machine raises a load of 750 Newton through a height of 16 m in 5 seconds. Calculate the power at which the machine works.
5. The speed of a vehicle of mass 500 kg increases from 36 km/h to 72 km/h. Calculate the increase in kinetic energy.
6. How is the power related to the speed at which a body can be lifted? How many kilograms will a man working at the power of 100 W, be able to lift at a constant speed of 1 m s^{-1} vertically? (g = 10 m/s^2)
7. A man of mass 60kg runs up a flight of 30 steps in 15 seconds. If each step is 20 cm high, calculate the power developed by the man. (Take g =10m/s^2)
8. The velocity of a body moving in a straight line is increased by applying constant force F, for some distance in the direction of motion. Prove that the increase in the kinetic energy of the body is equal to the work done by the force on the body.