



1. **Choose the correct option:**
 - i. The power of the water pump is 2kW. If $g = 10\text{m/s}^2$, the amount of water it can raise in one minute to a height of 10 m is.
 - a) 2000 litre
 - b) 1000 litre
 - c) 100 litre
 - d) 1200 litre
 - ii If force and displacement of a body are doubled, work done is
 - a) doubled
 - b) 4 times
 - c) halved
 - d) (1/4) times
2. **In each of the following questions, two statements are given one labelled. Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions 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) A is false, but R is true.
 - (i) Assertion: The energy used in one hour at the rate of 1 kilowatt is called 1 kilowatt hour.
Reason: Kilowatt hour is the unit of power.
 - (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 question.**
 1. List two conditions, which need to be satisfied for the work to be done on an object.
 2. 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.
 3. A body is thrown up with a kinetic energy of 10 J. If it attains a maximum height of 5m, find the mass of the body.

4. How much work is required for a 74 kg sprinter to accelerate from rest to 2.2m/s?
5. a) How is power related to the speed of the body at which a body can be lifted?
- b) How many kilograms will a man working at the power of 100 Watt be able to lift at constant speed of 1m/s vertically? [$g=10\text{m/s}^2$]

4. Answer the following case study-based questions

Riya and her brother Rahul decided to help their parents clean the garden. Riya used a wheelbarrow to move soil from one place to another, while Rahul tried to lift the same soil directly with a spade. Riya noticed that she could do the same amount of work with less effort and in less time. Later, they played on a swing. Riya pushed Rahul, and he started moving back and forth. Their father explained that when Riya pushed the swing, she transferred energy to Rahul, which made him move. He also told them that the energy of the swing changes continuously between potential and kinetic energy.

- (i) What is work? Explain with reference to Riya and Rahul's activity in the garden.\
- (ii) Why was Riya able to do the same amount of work with less effort compared to Rahul?
- (iii) Explain the transformation of energy that takes place when Rahul moves on the swing.
- (iv) State the relationship between work and energy.