# Work and Energy

## Fill in the blanks

1. Work done by earth in moving round the sun is …….
2. Energy possessed by rolling stone is ……
3. Device which converts electrical energy into mechanical energy is called ……
4. Commercial unit of energy is ……
5. CFL stands for ……..

## One mark questions

1. When is work said to be done against the force of gravity?
2. A body is thrown vertically upwards. Its velocity goes on decreasing. Write the change in kinetic energy when its velocity becomes zero.
3. If heart works 60 joules in one minute, what is its power?
4. Give the mathematical relation between power, force and velocity?
5. When is work done by force said to be negative?

## Two marks questions

1. A porter lifts a luggage of 15 Kg from the ground and puts it on his head 1.5 m above the ground. Calculate the work done by him on the luggage.
2. Can any object have momentum even if its mechanical energy is zero? Explain.
3. Taking the example of a simple pendulum, explain the variations in the forms of energy and the inter-conversions involved.
4. Express the power in Kw when a car is moving 108 Km/h under the action of a force of 2000 N.
5. State the Law of conservation of energy.

## Five marks Questions

1. (a) Define work done by a constant force on an object. Write an expression also for the work done
   (b) How much work will be done on an object by a force if the displacement of the object is zero?
   (c) What is the kinetic energy of an object? Write an expression for the kinetic energy of an object of mass m moving with a speed v.
2. (a) Define 'Power'. Differentiate between kilowatt and kilowatt hour.

(b) Two girls each of weight 400 N climb up a rope through a height of 8 m. Let the name of one of the girls is A and that of other is B. Girl A takes 20 s while B takes 50 s to accomplish this task. Calculate the power expended by each girl.

3. (a) Define gravitational potential energy.
   (b) Find the expression for the gravitational potential energy of a body of mass *m* at a height *h* above the ground.
4. A light and a heavy object have same momentum. Find out the ratios of their kinetic energies. Which one has the larger kinetic energy.
5. Prove that the work done on a moving object is always equal to the change in its kinetic energy. Calculate the work done required to stop a car of mass 1500 kg moving with a velocity of 60 km/h.