

**Instructions:**

Read the question paper carefully. Write neatly and legibly. Do not over write. Pay special attention to spelling. Read the answers before submitting the answer sheet.

## Part A

(6 x 1 = 6)

1. State the condition when the work done by a force is (i) Positive (ii) Negative. Explain with the help of examples.
2. A satellite revolves around the earth in a circular orbit. What is the work done by the satellite? Give reason.
3. A body of mass  $m$  falls down through a height  $h$ . Obtain an expression for the work done by the force of gravity.
4. With reference to the direction of action, how does a centripetal force differ from a centrifugal force during uniform circular motion?
5. Show that the sum of kinetic energy and potential energy is always conserved in case of a freely falling body under gravity from a height  $h$  when the body is (i) at the top (ii) has fallen a distance  $x$  (iii) has reached the ground.
6. A pebble is thrown up. It goes to a height and then comes back on the ground. State the different changes in form of energy during its motion.

## Part B

(4 x 1 = 4)

1. How is the kinetic energy of a moving cart affected if (i) its mass is doubled (ii) its velocity is reduced to  $1/3^{\text{rd}}$  of the initial velocity?
2. A box of mass 300 kg has gravitational potential energy stored in it equal to 29400 J. Find the height of the box above the ground.
3. The energy of an electron is  $4.0 \times 10^{-19}$  J. Express it in eV.
4. A physical balance has its arms of length 60 cm and 40 cm. What weight kept on the pan of the longer arm will balance an object of weight 100 gf kept on the other pan?