Class XI

Work, Energy and Power worksheet 1

1. A spring is cut into two equal halves. How is the spring constant of each half affected?   1

2. The momentum of an object is doubled. How does it's. K.E. change?   1

3. In which motion momentum changes but K.E. does not?   1

4. A light body and a heavy body have same linear momentum. Which one has greater K.E.?   1

5. A shot fired from cannon explodes in air. What will be the changes in the momentum and the kinetic energy?   2

6. Can a body have momentum without energy?   1

7. Obtain an expression for K.E. of a body moving uniformly?   3

8. What is meant by a positive work, negative work and zero work? Illustrate your answer with example?   3

9. A body of mass 2kg initially at rest moves under the action of an applied force of 7N on a table with coefficient of kinetic friction = 0.1. Calculate the
   (1) Work done by the applied force in 10s
   (2) Work done by the friction in 10s
   (3) Work done by the net force on the body in 10s.   3

10. Derive the expression for the potential energy stored in a spring?   3

Class XI

Work, Energy and Power worksheet 2

1. When an air bubble rises in water, what happens to its potential energy?   1

2. What should be the angle between the force and the displacement for maximum and minimum work?   1

3. What is work done in holding a 15kg suitcase while waiting for a bus for 15 minutes?   1

4. A light body and a heavy body have same kinetic energy. Which one has greater linear momentum?   1

5. Can a body have energy without momentum?   1

6. A particle moves along the x – axis form x = 0 t x = 5m influence of force given by $F = 7 – 2x + 3x_2$. Calculate the work done in doing so.   2

7. A body of mass 3kg makes an elastic collision with another body at rest and continues to move in the original direction with a speed equal to one – third of its original speed. Fine the mass of the second body.   2

8. Show that for a freely falling body the sum of its kinetic energy and potential energy remains constant at all points during its fall?   2

9. Ball A of mass m moving with velocity u collides head on with ball B of mass m at rest. If e be the coefficient of restitution then determine the ratio of final velocities of A and B after the collision.   3

10. If the momentum of the body increases by 20% what will be the increase in the K.E. of the body?   2

Class XI
Work, Energy and Power worksheet 3

1. If two bodies stick together after collision will the collision be elastic or inelastic?   1

2. When an air bubble rises in water, what happens to its potential energy?   1

3. A spring is kept compressed by pressing its ends together lightly. It is then placed in a strong acid, and released. What happens to its stored potential energy?   1

4. A body is moving along Z – axis of a co – ordinate system is subjected to a constant force F given by $\vec{F} = \left(-\hat{i} + 2j + 3k \right) N$. What is the work done by this force in moving the body a distance of 4m along the Z – axis?   2

5. A ball is dropped from the height h_1 and if rebounces to a height h_2. Find the value of coefficient of restitution?   2

6. State and prove work energy theorem analytically?   2

7. An object of mass 0.4kg moving with a velocity of 4m/s collides with another object of mass 0.6kg moving in same direction with a velocity of 2m/s. If the collision is perfectly inelastic, what is the loss of K.E. due to impact?   3

8 Prove that in an elastic collision in one dimension the relative velocity of approach before impact is equal to the relative velocity of separation after impact?   3

9. (a) Define potential energy. Give examples.
   (b) Draw a graph showing variation of potential energy, kinetic energy and the total energy of a body freely falling on earth from a height h?   3