



# INDIAN SCHOOL NIZWA - WORKSHEET

## PHYSICS

### CH: 6 WORK AND ENERGY

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Class: XI Sec: A

1.	<p>A long spring is stretched by 2cm. Its potential energy is V. If the spring is stretched by 10cm, its potential energy would be</p> <p>A. <math>V/25</math> B. <math>V/5</math> C. <math>5V</math> D. <math>25V</math></p>
2.	<p>Which of the following is not conserved during inelastic collision?</p> <p>A. Momentum B. Kinetic energy C. Both momentum and kinetic energy D. Neither momentum nor kinetic energy</p>
3.	<p>The KE of a body becomes 4 times its initial value. The new linear momentum will be</p> <p>A. Same as initial value B. Four times the initial value C. Twice the initial value D. Eight times the initial value</p>
4.	<p>A ball of mass <math>m</math> moving with a velocity <math>V</math> collides with an identical ball at rest. After collision, the first ball comes to rest. The speed of the other ball is</p> <p>A. <math>V/2</math> B. <math>2V</math> C. <math>V</math> D. zero</p>
5.	<p>A bomb of mass 1kg is thrown vertically upwards with a speed of 100m/s. After 5seconds, it explodes into two fragments. One fragment of mass 400g is found to go down with a speed of 25m/s. What will happen to the second fragment just after explosion?</p> <p>A. It will go upwards with speed of 100m/s B. It will go upwards with a speed of 40m/s</p>



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	<p>C. It will go upwards with a speed of 60m/s</p> <p>D. It will go downwards with a speed of 40m/s</p>
6.	<p>Case based question</p> <p>Work is said to be done by a force acting on a body, provided the body is displaced actually in any direction except in a direction perpendicular to the direction of force – mathematically, <math>W = F.S - FS \cos\theta</math>, whereas energy is the capacity of a body to do work and power is the rate of doing work. <math>P = W/t = F.V</math></p> <p>(i) If a box is pushed through 4m across a floor offering 100N resistance then the work done by the applied force is</p> <p>A. 100J</p> <p>B. 0J</p> <p>C. 400J</p> <p>D. 25J</p> <p>(ii) In the above case, the work done by the gravity is</p> <p>A. 981J</p> <p>B. 0J</p> <p>C. 400J</p> <p>D. 25J</p> <p>(iii) SI unit of power in terms of joule is</p> <p>A. J.s</p> <p>B. J/s</p> <p>C. Jm</p> <p>D. J/m</p> <p>(iv) A truck draws a tractor of mass 1000kg at a steady rate 20m/s on a level road. The tension in the coupling is 2000N, then the power spent on the tractor is</p> <p>A. 2400 KJ</p> <p>B. 4800 KJ</p> <p>C. 2000KJ</p> <p>D. 1500 KJ</p>
1.	What should be the angle between the directions of force and displacement for maximum and minimum work?
2.	Does the work done depend on how fast or slow a body is moved?
3.	State the conditions under which a force does no work.
4.	In a tug of war one team is slowly giving way to the other. What work is being done and by whom?



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5.	A man rowing boat upstream is at rest with respect to the shore. Is he doing work?
6.	Does a single force acting on a particle necessarily change its KE and momentum?
7.	When an air bubble rises in water, what happens to its potential energy?
8.	What kind of energy is stored in the spring of a watch?
9.	Can a body have momentum without energy?
10.	What is a conservative force?
11.	Two bodies of unequal masses have same linear momentum. Which one will have greater kinetic energy?
12.	How does the kinetic energy of a body change if its momentum is doubled?
13.	Two bodies of masses $m_1$ and $m_2$ have same linear momentum. What is the ratio of their kinetic energies?
14.	A force $F = i + 5j + 7k$ acts on a particle and displaces it through $s = 6i + 9k$ . Calculate the work done if the force is in Newton and displacement in metre.
15.	A body of mass 4kg initially at rest is subject to a force 16N. What is the kinetic energy acquired by the body at the end of 10s?
16.	A particle moves along the x axis from $x = 0$ to $x = 5$ m under the influence of a force given by $F = 7 - 2x + 3x^2$ . Find the work done in the process.
17.	If the linear momentum of a body increases by 50%, what will be the % increase in the kinetic energy of the body?
18.	How high must a body be lifted to gain an amount of potential energy equal to the kinetic energy it has when moving at speed 20m/s?
19.	A ball bounces to 80% of its original height. What fraction of its mechanical energy is lost in each bounce? Where does this energy go?
20.	A body of mass 2 kg is resting on a rough horizontal surface. A force of 20N is now applied to it for 10s, parallel to the surface. If the coefficient of kinetic friction between the surfaces in contact is 0.2, calculate: (a) work done by the applied force in 10s. (b) Change in kinetic energy of the object in 10s.
21.	An artificial satellite is at a height of 36,500Km above earth's surface. What is the work done by earth's gravitational force in keeping it in its orbit?
22.	A body is moving along a circular path. How much work is done by the centripetal force?
23.	Springs A and B are identical except that A is stiffer than B, ie, force constant $K_A > K_B$ . In which spring is more work expended if they are stretched by the same amount?
24.	A particle moves along the x axis from $x = 0$ to $x = 5$ m under the influence of a force given by $F = 7 - 2x + 3x^2$ . Find the work done in the process.
25.	A car of mass 1000 Kg accelerates uniformly from rest to a velocity of 54km/h in 5 seconds. Calculate (i) its acceleration (ii) its gain in KE (iii) average power of the engine during this period, neglect friction.