



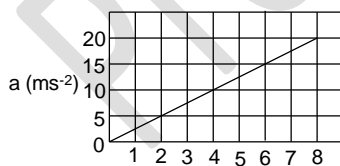
Chapter : WORK ENERGY AND POWER

Assignment 1

Class 11

Topic :- WORK ENERGY AND POWER

- The kinetic energy of a body becomes four times its initial value. The new momentum will be
 - Same as the initial value
 - Twice the initial value
 - Thrice the initial value
 - Half of its initial value
- If force and displacement of particle in direction of force are doubled. Work would be
 - Double
 - 4 times
 - Half
 - 1/4 times
- A particle is released from a height S . At certain height its kinetic energy is three times its potential energy. The height and speed of the particle at that instant are respectively
 - $\frac{S}{4}, \frac{3gS}{2}$
 - $\frac{S}{4}, \frac{\sqrt{3gS}}{2}$
 - $\frac{S}{2}, \frac{\sqrt{3gS}}{2}$
 - $\frac{S}{4}, \sqrt{\frac{3gS}{2}}$
- A position dependent force $F = 7 - 2x + 3x^2$ newton acts on a small body of mass 2 kg and displaces it from $x = 0$ to $x = 5 \text{ m}$. The work done in joules is
 - 70
 - 270
 - 35
 - 135
- A 10 kg brick moves along an x -axis. Its acceleration as a function of its position is shown in figure. What is the net work performed on the brick by the force causing the acceleration as the brick moves from $x = 0$ to $x = 8.0 \text{ m}$?



- 4 J
 - 8 J
 - 2 J
 - 1 J
- A long spring is stretched by 2 cm and its potential energy is U . If the spring is stretched by 10 cm ; its potential energy will be
 - $U/5$
 - $U/25$
 - $5 U$
 - $25 U$

7. Two putty balls of equal mass moving with equal velocity in mutually perpendicular directions, stick together after collision. If the balls were initially moving with a velocity of $45\sqrt{2} \text{ ms}^{-1}$ each, the velocity of their combined after collision is
 a) $45\sqrt{2} \text{ ms}^{-1}$ b) 45 ms^{-1} c) 90 ms^{-1} d) $22.5\sqrt{2} \text{ ms}^{-1}$
8. A particle free to move along the x -axis has potential energy given by $U(x) = k[1 - \exp(-x^2)]$ for $-\infty \leq x \leq +\infty$, where k is a positive constant of appropriate dimensions. Then
 a) At point away from the origin, the particle is in unstable equilibrium
 b) For any finite non-zero value of x , there is a force directed away from the origin
 c) If its total mechanical energy is $k/2$, it has its minimum kinetic energy at the origin
 d) For small displacements from $x = 0$, the motion is simple harmonic
9. When a spring is stretched by a distance x , it exerts a force, given by $F = (-5x - 16x^3) \text{ N}$. The work done, when the spring is stretched from 0.1 m to 0.2 m is
 a) $8.7 \times 10^{-2} \text{ J}$ b) $12.2 \times 10^{-2} \text{ J}$ c) $8.7 \times 10^{-1} \text{ J}$ d) $12.2 \times 10^{-1} \text{ J}$
10. In a head on elastic collision of a very heavy body moving at v with a light body at rest, velocity of heavy body after collision is
 a) v b) $2v$ c) Zero d) $\frac{v}{2}$
11. A bullet is fired from a rifle. If the rifle recoils freely, then the kinetic energy of the rifle is
 a) Less than that of the bullet b) More than that of the bullet
 c) Same as that of the bullet d) Equal or less than that of the bullet
12. A rubber ball is dropped from a height of 5 m on a planet where the acceleration due to gravity is not known. On bouncing, it rises to 1.8 m. The ball loses its velocity on bouncing by a factor of
 a) $16/25$ b) $2/5$ c) $3/5$ d) $9/25$
13. A running man has half the kinetic energy of that of a boy of half of his mass. The man speeds up by 1 m/s so as to have same $K.E.$ as that of the boy. The original speed of the man will be
 a) $\sqrt{2} \text{ m/s}$ b) $(\sqrt{2} - 1) \text{ m/s}$ c) $\frac{1}{(\sqrt{2}-1)} \text{ m/s}$ d) $\frac{1}{\sqrt{2}} \text{ m/s}$
14. A body of mass 10 kg is moving on a horizontal surface by applying a force of 10 N in forward direction. If body moves with constant velocity, the work done by force of friction for a displacement of 2m is
 a) -20 J b) 10 J c) 20 J d) -5 J
15. An engine pumps up 100kg of water through a height of 10 m in 5 s. Given that the efficiency of engine is 60%.
 If $g=10 \text{ ms}^{-2}$, the power of the engine is
 a) 3.3 KW b) 0.33 KW c) 0.033KW d) 33KW

