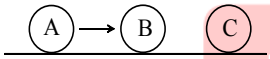
DPP
DAILY PRACTICE PROBLEMS

CLASS : XITH **SUBJECT : PHYSICS**
DATE : **DPP NO. :10**

Topic :- WORK ENERGY AND POWER

1. A particle moves along the x - $a$xis from x = x_1 to $x = x_2$ under the action of a force given by F=2x. Then the work done in the process is
   a) Zero b) x_2^2 - x_1^2 c) $2x_2(x_2 - x_1)$ d) $2x_1(x_1 - x_2)$

2. Three identical spherical balls A, B and C are placed on a table as shown in the figure along a straight line. B and C are at rest initially



The ball A and B head on with a speed of $10ms^{-1}$. Then after all collisions (assumed to be elastic) A and B are brought to rest and C takes off with a velocity of
   a) 5 $m\ s^{-1}$ b) 10 $m\ s^{-1}$ c) 2.5 $m\ s^{-1}$ d) 7.5 $m\ s^{-1}$

3. The displacement x in metre of a particle of mass m kg moving in one dimension under the action of a force is related to the time t in second by the equation $t = \sqrt{x} + 3$, the work done by the force (in joule) in first six seconds is
   a) 18 m b) Zero c) 9 $m/2$ d) 36 m

4. A body of mass 2 kg is projected at $20ms^{-1}$ at an angle 60° above the horizontal. Power Due to the gravitational force at its heights point is
   a) 200 W b) $100\sqrt{3}W$ c) 50 W d) Zero

5. The energy which an e^- acquires when accelerated through a potential difference of 1 volt is called
   a) 1 $Joule$ b) 1 eV c) 1 Erg d) 1 $Watt$

6. A spring gun of spring constant 90 $Ncm^{-1}$is compressed 12 cm by a ball of mass 16 g. If the trigger is pulled, the velocity of the ball is
   a) 50 ms^{-1} b) 9 ms^{-1} c) 40 ms^{-1} d) 90ms^{-1}

7. A body of mass 0.1 kg moving with a velocity of 10 m/s hits a spring (fixed at the other end) of force constant 1000 N/m and comes to rest after compressing the spring. The compression of the spring is
   a) 0.01 m b) 0.1 m c) 0.2 m d) 0.5 m

8. A body of mass 2 kg is projected at 20 m/s at an angle of 60° above the horizontal. Power on the block due to the gravitational force at its highest point is
   a) 200 W b) $100\sqrt{3}$ W c) 50 W d) Zero

9. A body of mass m moving with a constant velocity v hits another body of the same mass moving with the same velocity v but in the opposite direction and sticks to it. The velocity of the compound body after collision is
   a) v b) $2v$ c) Zero d) $v/2$

10. If the kinetic energy of a body becomes four times of its initial value, then new momentum will
   a) Becomes twice its initial value b) Become three times its initial value
   c) Become four times its initial value d) Remains constant

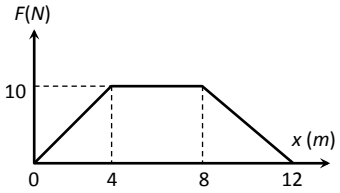
11. A body moving with a velocity v, breaks up into two equal parts. One of the part retraces back with velocity v.Then, the velocity of the other part is
   a) v, in forward direction b) 3 v in forward direction
   c) v, in backward direction d) 3 v in backward direction

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) $\frac{16}{25}$ b) $\frac{2}{5}$ c) $\frac{3}{5}$ d) $\frac{9}{25}$

13. A uniform chain of length L and mass M is lying on a smooth table and one third of its length is hanging vertically down over the edge of the table. If g is acceleration due to gravity, the work required to pull the hanging part on to the table is
   a) MgL b) $MgL/3$ c) $MgL/9$ d) $MgL/18$

14. Four smooth steel balls of equal mass at rest are free to move along a straight line without friction. The first ball is given a velocity of 0.4 m/s. It collides head on with the second elastically, the second one similarly with the third and so on. The velocity of the last ball is
   a) 0.4 m/s b) 0.2 m/s c) $0.1m/s$ d) 0.05 m/s

15. A particle of a mass 0.1 kg is subjected to a force which varies with distance as shown in fig. If it starts its journey from rest at $x = 0$, its velocity at $x = 12\ m$ is



a) $0\ m/s$ b) $20\sqrt{2}\ m/s$ c) $20\sqrt{3}\ m/s$ d) $40\ m/s$

16. The potential energy of a certain spring when stretched through a distance 'S' is 10 $joule$. The amount of work (in joule) that must be done on this spring to stretch it through an additional distance 'S' will be

a) 30 b) 40 c) 10 d) 20

17. A particle moves in a straight line with retardation proportional to its displacement. Its loss of kinetic energy for any displacement $x$is proportional to

a) x^2 b) e^x c) x d) $\log_e x$

18. A gun of mass 20 kg has bullet of mass 0.1 kg in it. The gun is free to recoil 804 J of recoil energy are released on firing the gun. The speed of bullet (ms^{-1}) is

a) $\sqrt{804 \times 2010}$ b) $\sqrt{\frac{2010}{804}}$ c) $\sqrt{\frac{804}{2010}}$ d) $\sqrt{804 \times 4 \times 10^3}$

19. A neutron having mass of $1.67 \times 10^{-27}\ kg$ and moving at $10^8 m/s$ collides with a deutron at rest and sticks to it. If the mass of the deutron is $3.34 \times 10^{-27}\ kg$ then the speed of the combination is

a) $2.56 \times 10^3\ m/s$ b) $2.98 \times 10^5\ m/s$ c) $3.33 \times 10^7\ m/s$ d) $5.01 \times 10^9\ m/s$

20. A body of mass 5 kg is thrown vertically up with a kinetic energy of 490 J. The height at which the kinetic energy of the body becomes half of the original value is

a) 12.5m b) 10m c) 2.5m d) 5m