DPP

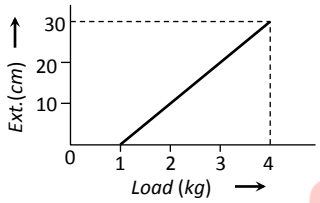
DAILY PRACTICE PROBLEMS

CLASS : XITH **SUBJECT : PHYSICS**

DATE : **DPP NO. :9**

Topic :- WORK ENERGY AND POWER

1. The pointer reading v/s load graph for a spring balance is as given in the figure. The spring constant is

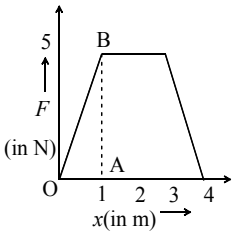


a) 0.1 kg/cm b) 5 $kg\ cm$ c) 0.3 kg/cm d) 1 kg/cm

2. A body is moving with 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) $3v$ in forward direction
   c) v in backward direction d) $3v$ in backward direction

3. A rope ladder with a length l carrying a man with a mass m at its end is attached to the basket of balloon with a mass M. The entire system is in equilibrium in the air. As the man climbs up the ladder into the balloon, the balloon descends b y a height h. Then the potential energy of the man
   a) Increase by $mg(l$ - h) b) Increase by mgl
   c) Increases by mgh d) Increases by $mg(2l$ - h)

4. The force F acting on a particle moving in a straight line is shown in figure. What is the work done by the force on the particle in the 1st meter of the trajectory



a) 5 J b) 10 J c) 15 J d) 2.5 J

5. The upper half of an inclined plane with inclination ∅ is perfectly smooth, while the lower half is rough. A body starting from rest at the top will again come to rest at the bottom. If the coefficient of the friction for the lower half is given by

a) $2\sin\phi$ b) $2\cos\phi$ c) $2\tan\phi$ d) $\tan\phi$

6. A car of mass 1250 kg is moving at 30 m/s. Its engine delivers 30 kW while resistive force due to surface is 750 N. What max acceleration can be given in the car

a) $\frac{1}{3}m/s^2$ b) $\frac{1}{4}m/s^2$ c) $\frac{1}{5}m/s^2$ d) $\frac{1}{6}m/s^2$

7. When two bodies collide elastically, then

a) Kinetic energy of the system alone is conserved
b) Only momentum is conserved
c) Both energy and momentum are conserved
d) Neither energy nor momentum is conserved

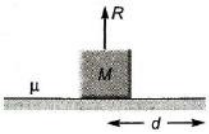
8. A chain of mass M is placed on a smooth table with 1/3 of its length L hanging over the edge. The work done in pulling the chain back to the table is

a) $\frac{MgL}{3}$ b) $\frac{MgL}{6}$ c) $\frac{MgL}{9}$ d) $\frac{MgL}{18}$

9. A spring, which is initially in its unstretched condition, is first stretched by a length$x$ and then again by a further length x.The work done in the first case is W_1, and in the second case is W_2 .Then

a) $W_2 = W_1$ b) $W_2 = 2W_1$ c) $w_2 = 3w_1$ d) $w_2 = 4w_1$

10. If reaction is R and coefficient of friction is μ, what is work done against friction in moving a body by distance d?



a) $\frac{\mu Rd}{4}$ b) $2\mu Rd$ c) μRd d) $\frac{\mu Rd}{2}$

11. A 16 kg block moving on a frictionless horizontal surface with a velocity of 4 m/s compresses an ideal spring and comes to rest. If the force constant of the spring be 100 N/m, then the spring is compressed by

a) 1.6 m b) 4 m c) 6.1 m d) 3.2 m

12. A nucleus with mass number 220 initially at rest emits an α - particle.If the Q value of the reaction is 5.5 MeV, calculate the kinetic energy of the α - particle

a) 4.4MeV b) 5.4MeV c) 5.6MeV d) 6.5MeV

13. An electric pump is used to fill an overhead talk of capacity $9m^3$ kept at a height of $10m$ above the ground. If the pump takes 5 minutes to fill the tank by consuming $10kW$ power the efficiency of the pump should be (Take $g = 10ms^{-2}$)
a) 60% b) 40% c) 20% d) 30%

14. A body of mass 10 kg is dropped to the ground from a height of 10 $metres$. The work done by the gravitational force is ($g = 9.8\ m/s^2$)
a) - 490 $joules$ b) +490 $joules$ c) - 980 $joules$ d) +980 $joules$

15. A body of mass 3 kg acted upon by a constant force is displaced by S metre, given by relation $S = \frac{1}{3}t^2$, where t is in second. Work done by the force in 2 seconds is
a) $\frac{8}{3}$ J b) $\frac{19}{5}$J c) $\frac{5}{19}$J d) $\frac{3}{8}$ J

16. A body of mass $m_1$collides elastically with another body of mass $m_2$at rest .If the velocity of m_1 after collision becomes 2/3 times its initial velocity, the ratio of their masses, is
a) 1:5 b) 5:1 c) 5:2 d) 2:5

17. For a system to follow the law of conservation of linear momentum during a collision , the condition is
Total external force acting on the system is zero.
Total external force acting on the system finite and time of collision is negligible.
Total internal force acting on the system is zero.
a) (1)only b) (2)only c) (3)only d) (1)and (2)

18. A cubical vessel of height 1 m is full of water. what is the amount of work done in pumping water out of the vessel?(Take g=$10ms^{-2}$)
a) 1250 J b) 5000 J c) 1000 J d) 2500 J

19. A bomb of mass 3.0 kg explodes in air into two pieces of masses 2.0 kg and 1.0 kg .The smaller mass goes at a speed of $80ms^{-1}$.The total energy imparted to the two fragments is
a) 1.07 kJ b) 2.14 kJ c) 2.4 kJ d) 4.8 kJ

20. Stopping distance of a moving vehicle is directly proportional to
a) Square of the initial velocity b) Square of the initial acceleration
c) The initial velocity d) The initial acceleration