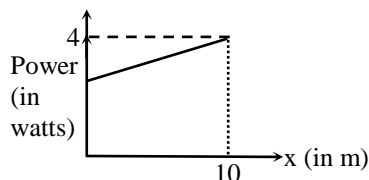


CLASS XI-PHYSICS
WORK, POWER AND ENERGY

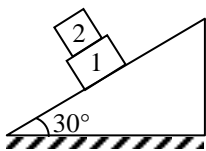
ASSIGNMENT-1

NUMERICAL QUESTIONS:

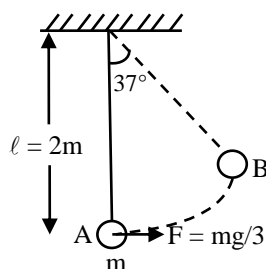
- Q.1** A particle of mass $\frac{10}{7}$ Kg is moving in the positive direction of x. Its initial position $x = 0$ & initial velocity is 1 m/s. The velocity at $x = 10$ is -



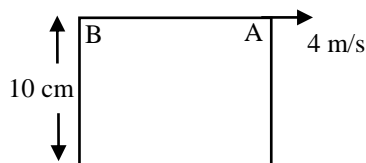
- Q.2** A man is throwing bricks of mass 2 kg onto a floor of height 2m. Bricks reaches to floor with speed $2\sqrt{10}$ m/s. Man throws 10 bricks in a minute. If power of man is W watt then $\frac{3}{10} W$ is equal to -
- Q.3** An over head tank of capacity 10 k litre is kept at the top of building 15 m high. Water falls in tank with speed $5\sqrt{2}$ m/s. Water level is at a depth 5 m below ground. The tank is to be filled in 1/2 hr. If efficiency of pump is 67.5% electric power used in hecto watt is -



- Q.4** A pendulum of mass $m = 2$ kg is pulled from position 'A' by applying a constant horizontal force $F = mg/3$. Velocity (in m/s) at point 'B' shown in figure -

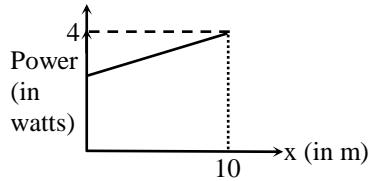


- Q.5** A cube of mass 3kg is kept on a frictionless horizontal surface. The block is given an impulse so that point 'A' acquires velocity 4 m/s in the direction shown. If speed of point B is $4\sqrt{2}$ m/s, K.E. of block (in Joule) minus 10 Joule is -



- Q.6** A ball of mass 1 kg is dropped from height 10 m. If hits the ground with speed 8 m/s, magnitude of work done by air friction is (in Joule) minus 60 joule is -

- Q.7** A particle of mass $\frac{10}{7}$ Kg is moving in the positive direction of x . Its initial position $x = 0$ & initial velocity is 1 m/s. The velocity at $x = 10$ is -



- Q.8** A block of mass $m = 1$ kg moving on horizontal surface with speed $u = 2$ m/s enters a rough horizontal patch ranging from $x = 0.10$ m to $x = 2.00$ m. If the retarding force f_r on the block in this range is inversely proportional to x over this range i.e.

$$f_r = \frac{-k}{x} \quad 0.10 < x < 2.00$$

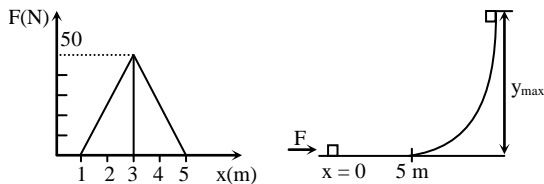
$$= 0 \quad \text{for } x < 0.10 \text{ and } x > 2.00$$

If $k = 0.5$ J then the speed of this block as it crosses the patch is (use $\ln 20 = 3$) in m/s is -

- Q.9** A particle moves in a straight line with its retardation proportional to its displacement ' x '. Change in kinetic energy is proportional to n^{th} power of x , where n is -

- Q.10** A particle of mass 10^{-2} kg is moving along the positive x -axis under the influence of a force $F(x) = -K/(2x^2)$ where $K = 10^{-2}$ Nm². At time $t = 0$ it is at $x = 1.0$ m and its velocity is $v = 0$. Find its velocity when it reaches $x = 0.50$ m.

- Q.11** A force shown in the $F - x$ graph is applied to a 5 kg cart, which then coast up a ramp as shown. Calculate the maximum height, y_{max} , at which cart can reach? ($g = 10$ m/s²)



- Q.12** A man is drawing water from a well with a bucket which leaks uniformly. The bucket when full weights 20 kg and when it arrives the top only half the water remains. The depth of the water is 20 m. What is the work done?

- Q.13** A person is painting his house walls. He stands on a ladder with a bucket containing paint in one hand and a brush in other. Suddenly the bucket slips from his hand and falls down on the floor. If the bucket with the paint had a mass of 6.0 kg and was at a height of 2.0 m at the time it