Question: 1

An object of mass 1 kg is dropped onto a floor from a height of 2m. Using the conservation of mechanical energy, calculate the velocity of the object when it strikes the floor.

By using conservation of mechanical energy:-

$\therefore$ K.E $= \frac{1}{2}mv^2$

g.p.e $= mgh$

$\therefore \frac{1}{2}mv^2 = mgh$

$\Rightarrow v^2 = 2gh$

$\therefore v = \sqrt{2 \times g \times h}$

$= (\sqrt{2 \times 9.8 \times 2})\ ms^{-1}$

$= \sqrt{39.2} = 6.26\ ms^{-1}$.

Here,

~~mass = 1~~ $g = 9.8\ ms^{-2}$

$m = 1\ kg$

$h = 2m$.

$v = ?$

Ques no:2

The diagram shows a simple pendulum where the bod is displaced from the equilibrium position B. Apply the conservation of mechanical energy and ~~Apply the~~ calculate the velocity of the bob at position B. Does the velocity depend on the mass of the bob?

Ans: 1

conservation of mechanical energy:-

$K.E = \frac{1}{2}mv^2$

$g.P.e = mgh$

$\therefore \frac{1}{2}mv^2 = mgh$

$\therefore v^2 = 2gh$

$\therefore v = \sqrt{2gh} = \sqrt{2 \times 9.8 \times 0.5}$

$= \sqrt{9.8} = 3.13 \ ms^{-1}$

Here,

$g = 9.8$

$h = 0.5 \ m$

$v = ?$

Ans: 2

The velocity does not depend on the mass of the ~~bod~~ bob because acceleration remains the same.