Home Assignment

Date
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1. The figure shows four situations in which a force acts on a box while the box either slides to the right with displacement $\Delta \vec{x}$ or doesn't budge as indicated. The force on each box is shown. Rank the situations according to the amount of the work done by the force on the box during its displacement from greatest to least.

Ans.

a) $W = F \times S = 1N \times 1m = 1J$

b) $W = F \times S = 3N \times 0m = 0J$

c) $W = F \times S = 2N \times 1m = 2J$

d) $W = F \times S = 2N \times 2m = 4J$

Descending order (greatest to least)

= d (4J), c (2J), a (1J), b (0J)

2. A body of mass 1 kg has kinetic energy 1 J when its speed is

Ans. $K = \frac{1}{2} m v^2$

$K = 1\,J$

$M = 1\,kg$

$\Rightarrow 1 = \frac{1}{2} \times 1 \times v^2$

$\Rightarrow v^2 = 1$

$\Rightarrow v = 1\,m/s$

3. The kinetic energy of a body will become eight times if

Ans. both the mass and velocity are doubled.

4. A uniform force of 4N acts on a body of mass 8 kg for distance of 2 m. The K.E. acquired by the body is

Ans. Force = 4N 8J

$M = 8\,kg$

5. $\sqrt{2}$ times

6. independent of mass m

7. $F_{net} = ma$

$= 500a$

$\therefore = 1000 + 500 = 1500\,N$

Now, $v^2 - u^2 = 2as$

$\Rightarrow 20^2 - 0^2 = 2 \times 2 \times s$

$\Rightarrow s = 100\,m$

$W = F \times s$

$= 1500 \times 100 = 1.5 \times 10^5\,J$

POCO
SHOT ON POCO F1