

Question #74276, Physics / Mechanics | Relativity |

A body of mass 10kg initially at rest is subjected to a force of 20N for 1second. Calculate the change in kinetic energy during that time.

Need to find: K(kinetic energy)?

$$m = 10 \text{ kg}$$

$$F = 20 \text{ N}$$

$$t = 1 \text{ s}$$

$u = 0$, where u is initial velocity.

Solution:

According to first equation of motion, $v = u + a \cdot t$, where a – acceleration.

$$F = m \cdot a \rightarrow a = \frac{F}{m} = \frac{20 \text{ N}}{10 \text{ kg}} = 2 \frac{\text{m}}{\text{s}^2}$$

$$\text{Then, } v = 0 + 2 \cdot 1 = 2 \frac{\text{m}}{\text{s}}, K = \frac{m \cdot v^2}{2} = \frac{10 \cdot 2^2}{2} = 20 \text{ J}$$

Answer: The change in kinetic energy during 1 second is equal 20 J

Answer provided by <https://www.AssignmentExpert.com>