Answer on Question #43215, Physics, Mechanics | Kinematics | Dynamics

When the speed of a body is doubled and the mass is reduce to half

A. its kinetic energy is doubled

B. its potential energy is doubled

C. its rest energy is doubled

D. its momentum is doubled

E. its mechanic energy is doubled

Solution:

The kinetic energy of a body is

$$E_k = \frac{1}{2}mv^2$$

Thus, if the speed of a body is doubled ($v_2 = 2v_1$) and the mass is reduce to half ($m_2 = \frac{1}{2}m_1$), then

$$\frac{E_{k2}}{E_{k1}} = \frac{m_2 v_2^2}{m_1 v_1^2} = \frac{\frac{1}{2}m_1 4v_1^2}{m_1 v_1^2} = 2$$

Answer: A. its kinetic energy is doubled