Answer on Question #43197-Physics-Mechanics-Kinematics-Dynamics

A body is initially at rest.it undergoes one dimensional motion with constant acceleration. The power delivered to it at the same time t is proportional to?

Solution

Mass of the body is m.

Acceleration of the body is a.

Using Newton's second law of motion, the force experienced by the body is given by the equation:

$$F = ma.$$

Both m and a are constants. Hence, force F will also be a constant.

$$F = ma = Constant.$$

The velocity v for uniformly accelerated motion is

$$v = u + at = 0 + at = at.$$

Power is given by the relation:

$$P = Fv = ma \cdot at = ma^2t.$$

As acceleration is constant, hence

$$P \propto t.$$