1. A body is initially at rest. It undergoes one-dimensional motion with constant acceleration. The power delivered to it at time t is proportional to

1) t^2
2) $t^{1/2}$
3) $t^{3/2}$
4) t

Sol. 4) t

From Newton's first equation of motion,

$v = u + at$

where v is the final velocity

u is the initial velocity, a is the acceleration of the body and

t is the time taken

Given, $u = 0$.

So, $v = at$

Power is given by

$P = F \times v$

$\Rightarrow P = ma \times at$ ...[$F = ma$]

$\Rightarrow P = ma^2t$

Since m and a are constant,

$P \propto t$

Hence, power is directly proportional to the time