

$$(3) \Rightarrow (1) \quad v \times G$$

$$(1) \Rightarrow (2) \quad \text{critical}$$

$$(2) \Rightarrow (1) \quad 2Hx^{-1} \leq H$$

$$h \in H$$

$$(2) \Rightarrow (3)$$

$$(3) \Rightarrow (1)$$

NCERT Exemplar Problems :-

(1) A body of mass 2kg travels according to the law: $x(t) = pt + qt^2 + rt^3$ where $p = 3 \text{ m/s}$, $q = 4 \text{ m/s}^2$, $r = 5 \text{ m/s}^3$. The force acting on the body at $t = 2$ seconds is:

(A) 136 N (B) 134 N (C) 158 N (D) 68 N

Ans :- (A) Given $x(t) = 3t + 4t^2 + 5t^3$

From Newton's 2nd Law: $F = m \frac{d^2x}{dt^2}$

$$\frac{d^2x}{dt^2} = \frac{d}{dt} [3 + 8t + 15t^2] = 8 + 30t$$

Also, given $m = 2 \Rightarrow$ At $t = 2 \text{ sec}$

$$F = m \frac{d^2x}{dt^2} \Big|_{t=2}$$

$$= 2(8 + 30(2)) = \boxed{136 \text{ N} = F}$$