

Q 03

The maximum and minimum distances of a comet from the sun are 1.6×10^{12} m and 8.0×10^{10} m respectively. If the speed of the comet at the nearest point is 6×10^4 ms^{-1} , the speed at the farthest point is: **[March 16, 2021 (I)]**

- (a) 6.0×10^3 m/s (b) 3.0×10^3 m/s
(c) 4.5×10^3 m/s (d) 1.5×10^3 m/s

(b) From angular momentum conservation

$$\therefore mv_1r_1 = mv_2r_2$$

$$\text{or, } 6 \times 10^4 \times 8 \times 10^{10} = v_2 \times 1.6 \times 10^{12}$$

$$\Rightarrow v_2 = \frac{6 \times 8}{1.6} \times 10^2 = 3 \times 10^3 \text{ m/s}$$