

Question 2. A ball of mass 100g is moving with a velocity of 100 msec⁻¹. Find its wavelength.

A. 6.63×10^{-35} m

B. 6.63×10^{-30} m

C. 6.63×10^{-33} m

D. 6.63×10^{-32} m

Solution: (A)

Using De-broglie's equation, given $m = 100\text{g}$, $v = 100 \text{ m/s}$

$$\lambda = h / mv$$

$\lambda =$ De-broglie wavelength

$$M = 100\text{g} = 100 / 1000 \text{ kg} = 0.1 \text{ kg}$$

$$v = 100 \text{ ms}^{-1}$$

$$\lambda = 6.626 \times 10^{-34} / 0.1 \times 100 = 6.626 \times 10^{-35} \text{ m}$$