

8. The de Broglie wavelength of a car of mass 1000 kg and velocity 36 km/hr is :

$$(h = 6.63 \times 10^{-34} \text{ Js})$$

$$(1) 6.626 \times 10^{-31} \text{ m}$$

$$(2) 6.626 \times 10^{-34} \text{ m}$$

$$(3) 6.626 \times 10^{-38} \text{ m}$$

$$(4) 6.626 \times 10^{-30} \text{ m}$$

Solution:

$$\text{Given } h = 6.63 \times 10^{-34} \text{ J/s}$$

$$m = 1000 \text{ kg}$$

$$v = 36 \text{ km/hr} = 36 \times 10^3 / (60 \times 60) \text{ m/s} = 10 \text{ m/s}$$

$$\lambda = h/mv$$

$$= 6.63 \times 10^{-34} / 1000 \times 10$$

$$= 6.63 \times 10^{-38} \text{ m}$$

Hence option (3) is the answer.