

Question 1. A particle is dropped from a height H . The de-Broglie wavelength of the particle as a function of height is proportional to (a) H (b) $H^{1/2}$ (c) H^0 (d) $H^{-1/2}$

Solution:

Handwritten solution on lined paper:

W. $v^2 = 2gh$, $v = \sqrt{2gh}$
 $v \propto H^{1/2}$

Also, $\lambda = \frac{h}{mv}$

$\lambda \propto v^{-1}$
 $\lambda \propto H^{-1/2}$