CL21_Q1. Compare the energy levels of the first three quantum states of identically sized finite and infinite potential wells.

Answer

In the case of the finite potential well the energy of the particle can be written as

$E_{finite} = \frac{h^2\pi^2n^2}{2m(width\ of\ the\ well\ where\ \psi \to 0)^2} = \frac{h^2\pi^2n^2}{2m(L+2\Delta x)^2}$, where n=1,2,3.....

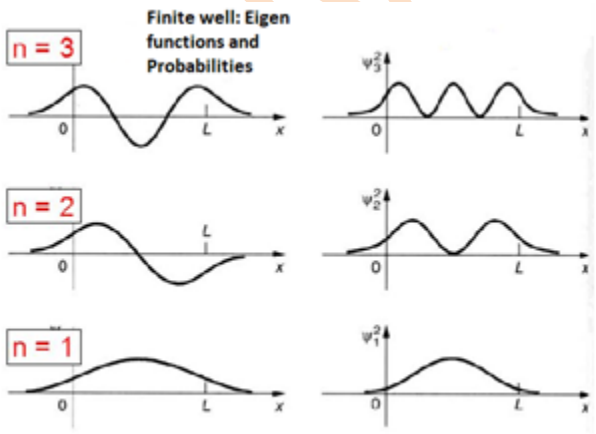
Hence the energy values are less than the energy values for the corresponding states of an infinite potential well of the width L.

Eigen energy values for an identical infinite well is given by $E_n = \frac{h^2n^2}{8mL^2}$ where n = 1,2 3...

First quantum state for n=1. Second state for n=2 and third quantum state for n=4.

CL21_Q2. A particle trapped in a finite potential well. Sketch the Eigen functions for first three energy states.

Answer



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