1. [10 pts] Sketch the n=6 wave function for the potential energy shown below:

\[ U(x) \]

\[ E_6 \]

\[ 0 \rightarrow L \]

**Solution**

1. We have kinetic energy

\[ KE = \frac{p^2}{2m} = (E - V) \]

\[ \therefore \lambda \propto \frac{1}{(E-V)^{\frac{1}{2}}} \]

\[ \therefore \lambda_{I} < \lambda_{II} \]

2. KE is small in region II

Hence, particle has higher probability of exiting in this region. Therefore, amplitude of \( \psi(x) \) is more.

3. \( E_6 \) corresponds to 6 antinodes.