

CL21_Q1. How are the energy values of a quantum mechanical oscillator fundamentally different from the energy values of a classical oscillator?

CL21_Q2. The energy of a linear harmonic oscillator in the third excited state is 0.1 eV. Find the frequency of the oscillator.

CL21_Q3. Sketch the wave functions and probability densities for the first two quantum states of quantum harmonic oscillators.

CL21_Q4. A lithium atom, mass 1.17×10^{-26} kg, is vibrating with simple harmonic motion in a crystal lattice, where the force constant k is 64.0 N/m. (a) what is the ground state energy of this system in eV? (b) What would be the wavelength of the photon that could excite this system to the $n = 1$ level?

CL21_Q4. Establish Schrodinger's equation of a linear harmonic oscillator and write its solution.