

Quiz on Chapter 6

1. What is the formula for the first order correction to a non-degenerate energy eigenvalue?
2. Whatever the formula for the n th order correction to an energy eigenvalue is, it's probably pretty complicated. How many powers of the perturbation H' should appear in the n th term?
3. Consider an unperturbed system with a set of non-degenerate energy levels. Say they are all equally spaced (like in the harmonic oscillator) with spacing E_s . Say you calculate the first order correction to the n th level and get ΔE_n . Under what conditions would you expect this to be a reasonable approximation? What is the extreme version of the case where it would not be good?
4. What is the general form of the spin-orbit interaction in Hydrogen (not caring about constants)?