

Things You Should Know

Chapters 7: Approximation Methods

Be able to define the following terms (using words, equations, or figures):

Perturbation Theory
Zeroth-order wave function
First-order correction
Variational principle
Trial function
Secular determinant

Zeroth-order energy
Zeroth-order Hamiltonian
Second-order correction
Variational function
Secular equation

Concepts and Exercises:

1. Be able to solve simple problems using perturbation theory. Be able to identify the zeroth-order problem and the perturbation to the Hamiltonian.
2. Know the basic approach of the variational principle, and be able to discuss the detailed steps you would take to apply it. Be able to use it for simple systems.
3. Know how you would use the variational principle with more than one variational parameter.
4. Be able to do all the assigned exercises.