

Atomic Physics Assignment 6

10 marks

1. Consider the effect of a magnetic field on the hydrogen ground state.
 - a) Write down the Hamiltonian.
 - b) Write down a suitable set of basis states.
 - c) Find the eigenvalues and eigenstates.
 - d) Plot the Eigenenergies vs. magnetic field.
 - e) For the low field limit, show the results for part c agree with perturbation theory.
 - f) For the high field limit, show the results for part c agree with perturbation theory.