QUANTUM MECHANICS I

PHYS 516

Problem Set # 6

Distributed: Feb. 25, 2011

Due: March 4, 2011

1. Stark Effect: A hydrogen atom in the $n = 3$ level with degeneracy $3^2 = 9$ (neglect spin) finds itself in a uniform time-independent external electric field $\mathbf{E}$. Compute the eigenvalues and the eigenfunctions. Label all states accurately.

2. Finite Nuclear Size: Compute the energy shift (in eV) of the $2s$ and $2p$ states of the hydrogen atom due to the finite nuclear size.