F20 PHYSICS 137B: Midterm Review Problems

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1 Identical particles

1.1

Compute the 4-body wavefunction with 1-particle states $\psi_a, \psi_b, \psi_c, \psi_d$ assuming that the particles are a) distinguishable; b) bosons; c) fermions.

1.2

Griffiths problems: 5.9, 5.18

2 Addition of angular momentum

Griffiths problems: 4.65, 4.67

3 Time-independent, non-degenerate perturbation theory

Griffiths problems: 7.4, 7.52

4 Time-independent, degenerate perturbation theory

Griffiths problems: 7.12, 7.39

5 Fine structure, Zeeman effect, hyperfine structure

Griffiths problems: 7.27, 7.29