

PHY 6646 - Quantum Mechanics II - Spring 2021
Homework set # 3, due February 5

1. Problems 14.4.5, 14.5.1, 14.5.4 and 15.1.2 in Shankar's book.

2. Consider three spin 1/2 systems, $j_1 = j_2 = j_3 = \frac{1}{2}$. There are a total of eight direct product states $|j_1 m_1 \rangle |j_2 m_2 \rangle |j_3 m_3 \rangle$. Obtain eight linear combinations of the direct product states which are eigenstates of the total angular momentum $J^2 = (\vec{J}_1 + \vec{J}_2 + \vec{J}_3)^2$ and the z -component of total angular momentum $J_z = J_{1z} + J_{2z} + J_{3z}$. (Hint: First add two spins together, then add the third to the result.)