Homework 3

1. (20 points) Express $\Phi_{j,m_j}$ through $\psi_{l,m_l,s,m_s}$ for general case of $s = 1/2$ and $l$.

2. (15 points) Obtain Recursion Relation for Clebsch - Gordan coefficients

3. (25 points) Express the deuteron wave function at different total spin projections through the radial wave functions, spherical wave functions as well as proton and neutron spin function.
   Show explicitly that the three components of the deuteorn are orthogonal.

4. (20 points) Construct the total spin wave function of the proton consisting of three constituent quarks.