

UNIVERSITY OF HYDERABAD
School of Physics

Jul 2010 - Dec 2010
M.Sc. III-Semester

Quantum Mechanics-II

Time : 1hr
MM : 20

Session-II::Tutorial Addition of Angular Momenta

- ⊙ The first two problems are for tutorials. The remaining problems are for you to practise.
- [1] Use tables of Clebsch Gordon Coefficients and construct the states $|JM\rangle$ of definite total angular momentum in terms of the states with $j_1 = 2, j_2 = \frac{1}{2}$
- [2] Using the first principle approach discussed in the class, construct the Clebsch Gordon Coefficients for $j_1 = 2, j_2 = \frac{1}{2}$
- [3] Use tables of Clebsch Gordon coefficients and construct states, $|JM\rangle$, of definite total angular momentum in terms of states with $j_1 = 1, j_2 = \frac{1}{2}$
- ⊙ For the last problem you may use tables or first principles approach.
- [4] Two particles A and B , both have angular momenta $j_1 = j_2 = 1$. Use the notation $|Am_1\rangle|Bm_2\rangle, m_1 = 0, \pm 1, m_2 = 0, \pm 1$ to denote the states with definite $J_z^{(1)}, J_z^{(2)}$ values. Construct the two particle states with total angular momenta $J = 0, 1, 2$, for a two particle system both having spin 1. Verify that the states with $J = 0, 2$ are symmetric and that with $J = 1$ is antisymmetric under an exchange of m_1 and m_2 .

Date : Aug 9, 2010