

PHYSICS 828

Home Work Assignment # 4

1/28/2011

Due: Fri., Feb. 4, 2011.

Completed assignments should be placed in the grader N. Ramalingam's mail box in PRB by 5:00 PM.

1. Vector operators: Shankar Ex. 12.4.4 (p. 320 - 321). Check that position \mathbf{R} , momentum \mathbf{P} and angular momentum \mathbf{L} all transform like vector operators.
2. Shankar Ex. 12.5.2 (p. 329). (You will see that you have extensively used the operators denoted by $J_x^{(1/2)}$, $J_y^{(1/2)}$ and $J_z^{(1/2)}$ last quarter, just that you used a different notation!)
3. Shankar Ex. 12.5.3 (p. 329).
4. *Read* Shankar Ex. 12.5.10 (p. 337 - 338) carefully. You do *not* have to hand in the solution.
5. Shankar Ex. 12.5.12 (p. 338). Please be sure you understand the meaning of this question on the parity of orbital angular momentum eigenfunctions.
6. Shankar Ex. 12.5.13 (p. 338).
7. Shankar Ex. 12.6.1 (p. 340).
8. Shankar Ex. 12.6.2 (p. 340).
9. Shankar Ex. 12.6.8 (p. 349).
10. Shankar Ex. 12.6.9 (p. 349).