Modern Physics (PHY 3305) Lecture Notes

HomeworkAssignment005

SteveSekula, 18 February 2010 (created 18 February 2010)

Expectations for the quality of your handed-in homework are available at http://www.physics.smu.edu/sekula/phy3305/homework.pdf. Failure to meet these guidelines will result in loss of points as detailed in that document. This assignment covers material from Harris Ch. 5.1-5.8. It is worth 200 points.

no tags

NOTE NOTE NOTE: This assignment is due Thursday, Mar. 4 at 3:30 p.m.

- HARRIS, *CH5-1* (5 Points)
    - *In case this question is not clear, think about it this way: "What does a particle being confined by a force to a "small" region have to do with the fact that energy appears to be quantized for such a particle?"*
- HARRIS, *CH5-2* (10 Points)
- HARRIS, *CH5-4* (15 Points)
- HARRIS, *CH5-7* (10 Points)
- HARRIS, *CH5-21* (20 Points)
    - *NOTE: If you use a computer to plot this function, you must hand in all information used in making the plot to demonstrate your understanding of the minimum and limiting behavior of the function*
    - *HINT: remember what it means, using calculus, to find the minimum of a function.*
- HARRIS, *CH5-23* (20 Points)
- HARRIS, *CH5-26* (20 Points)
    - *HINT: apply the infinite well model to the nucleus and show work defending your answer to this question.*

- HARRIS, *CH5-40* (50 Points)
    - *HINT: This is a challenging problem - attempt as much of it as you*

can. Use what you have learned - attack the problem in pieces, as is suggested when it asks you to write the Shroedinger Wave Equation for each of the 3 regions of the problem. Apply continuity conditions at the boundaries of the various regions to solve for the coefficients of the wave functions in each region. Ask for help if you get stuck. Work together if you are struggling alone.

- HARRIS, *CH5-94* (10 Points)
- HARRIS, *CH5-95* (20 Points)
- HARRIS, *CH5-96* (20 Points)

Notes: if you're having trouble with integrals or derivatives in the above problems, let me know so I can direct you to resources.