Physics 2610H: Assignment II

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Problem 1. Write out the total wave function $\Psi(x,t)$ for an electron in the $n = 3$ state of a 10 nm wide infinite well. Other than the symbols x and t, the function should include only numerical values.

Solution 1.

Problem 2. An electron in the $n = 4$ state of a 5 nm wide infinite well makes a transition to the ground state, giving off energy in the form of a photon. What is the photon's wavelength?

Solution 2.

Problem 3. What is the probability that a particle in the first excited ($n = 2$) state of an infinite well would be found in the middle third of the well? How does this compare with the classical expectation? Why?

Solution 3.