Time remaining:
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This is only a preview of the survey. Responses will not be saved. Close

Final Review Pretest

University of Colorado

Please type your name in the form: Last, First:

Required.

NOTE!! Please type in your CU userid (that's the username you use to log in to CULearn. We do NOT want your password. It probably looks like your last name, perhaps with a few extra characters. Note that it is definitely NOT your numerical (9 digit) student ID!!
This script cannot "error check", you have to be sure you type it in correctly! Thanks

Please type your CU userid:

Required.

Q1:

a) At time, $t = 0$, consider a quantum mechanical system which is known to be in the state, $\Psi(x, t = 0)$. Which of the pieces of information below is *sufficient* in order to find the state of the system at a later time?

Required.

Select one...

b) Explain your reasoning.

Required.

Q2:

a) Consider a harmonic oscillator where the energy eigenstates are $\psi_n(x)$ where n is a non-negative integer. The energy eigenvalues are $E_n = (n + \frac{1}{2})\hbar\omega$. Consider the probability density for each of the following initial states:

I: $\Psi_1(x, t = 0) = \psi_2(x)$
II: $\Psi_2(x, t = 0) = (\psi_4(x) + \psi_5(x))/\sqrt{2}$
III: $\Psi_3(x, t = 0) = (\psi_2(x) + \psi_4(x))/\sqrt{2}$

Does the probability density of any of these states change with time?

Required.

Select one...

b) Explain your reasoning.

Required.

Q3:

a) Still thinking about the three states above, how fast are their probability densities changing with time?

Required.

Select one...

b) Explain your reasoning.

Required.

Q4:

a) Consider an observable operator, $\hat{Q}$.At time, $t = 0$, we measure $\hat{Q}$ and obtain the eigenvalue, q. Thus, at time, $t = 0$, the system is in the state, $|q\rangle$. Does the system remain in this state as time passes if *no* other measurement is made?

Select one...

b) Explain your reasoning.

Required.

Submit responses

Questions or Comments?
Contact the 123 tutorial pretest coordinator at uwttl123@u.washington.edu