Fill in the Blanks (Quiz) on Basic QC

The languages of Quantum Mechanics are _____ differential equations and linear algebra.
partial

The languages of Quantum Mechanics are partial differential equations and linear ______
algebra

Every electron is either _____ or white and no other color
black

Every electron is either ____ or soft
hard

A box exists to determine the color and hardness of an electron by the _____ of the electron after it exits the device
position

The function of a box that can determine color or hardness of an electron produces results that are ______ 100% of the time
repeatable

The degree of _____ between electron color and hardness can be determined by the placement of multiple detection devices.
correlation

The color and hardness of electrons are not _______ when measuring
correlated

In this tri-box scenario, ____ of the electrons come out "white"
50%

No initial electron ______ can determine the color or hardness of that electron after it has exited the first color-hardness detection box
property

Probability is enforced by us by ______
observation

The probability of the second box detection of color or hardness being 50/50 is immutable and ______ of the materials and methods of the boxes functioning!
independent

It is ______ to build a dual function hardness/color detection box for electrons
impossible

It is _____ to say that an electron has a particular color and hardness.

meaningless

The uncertainty of simultaneoulsy determining color and hardness of electrons ____ to massive particles
scales

After electron color or hardness has been detected, a mirror will change the ______ of the electron but not the color or hardness
direction

This is an example of a device that uses _____ to cause electrons to reconvene.
mirrors

_____ cannot be split in two or take two paths at once
electrons

An electron is ___ hard or soft or both or neither is this scenario
not

Every electron exits a hard box as hard or soft but every electron needn't be hard or soft, but rather can be in a ______ of hardness or softness
superposition

Cathode ray tube is a gun that shoots _____ at a phosphorescent screen
electrons

_____ particles come from the decay of radioactive particles
alpha

We know that ____ exists because if you shoot alpha particles at a thin foil of atoms, then the occasionally ricochet back in the direction of the shoot proving that there are high density cores inside atoms
nuclei

When you accelerate a charge it _______
radiates

In Classical Physics, atoms should not _______ , because they don't behave like particles should
exist

Protons are paired by a _____ force otherwise they would repel one another
strong

The rules of abstract vector space in Quantum Mechanics state that any vector can be multiplied by a constant to get a new ______
vector

The rules of abstract vector space in Quantum Mechanics state that every ____ of vectors can be added to create a new vector
pair

The rules of abstract vector space in Quantum Mechanics state that every vector is represented by a column vector of _____ numbers
complex

The inner product of a vector times itself <a | a> is always a ______ real number and can be thought of as the square of the size of the vector or the magnitude of a vector
positive

A Complex _____ is a separate vector space and is a row vector that corresponds to a column vector
conjugate

|+> is an electron pointing ___
up

|-> is an electron pointing ___
down

______ vectors in this vector space represent that state of the qubit
normalized

Vector [a1 a2] is all the possible _____ that a prepared electron could be pointing to
directions

The ____ of the coefficients of a column equals the probability for up and probability for down, and that probability must add up to 1
square

Anything that can be measured and quantified with a real number is called an _______
observable

Observables can be thought of as points on a plane with each point representing a _____ input number
function

P-sub-n, is the _____ that you get the nth-state of an observable
probability

To figure the total probability of an observable you add up all of the observable function input points ____ the given probability for each point (i.e. weight them according to their probability)
times

Observables are related to the concept of a linear operator or a _______
matrix

If an observable has a state that was one and zero everywhere else then the expected value would be the _____ of the state that was a one.
probability

For all possible observable, if you know how to calculate the average expected value then you can construct the probability ______ of all expected values
distribution

The mathematical representation of observables are _____
matrices

A matrix is an _____ on a vector
operation

A _____ is an operations on a vector
matrix

If you multiply a vector by a matrix you get a new _____
vector

To multiply a vector by a matrix you take the subsequent vector column entries individually and multiply then by the corresponding row entry in the matrix and the ____ the products to return to the original dimensions of the vector
add

The notion of a _____ matrix corresponds to the notion of a real number
Hermitian

If you take an element of a matrix M-sub-ij, and then there is M-sub-ji (the reflected matrix element), in a Hermitian matrix the new elements are the complex ______ of the reflected position elements
conjugates

A number that is, itself, equal to its complex conjugate is ____
real

The ______ of a Hermitian matrix are _____ real
always

The ____ diagonal numbers are complex conjugates of each other
off

Hermitian matrices are the quantum version of _______
observables

The classic notion of observables are a function of their _____ points. i.e. each point is like the sides of dice
state

A complex number has a real part and and an _____ part
imaginary

The facts of life are
(1) Atoms exist
(2) _______ exists
(3) Atomic Spectra
(4) Photoelectric Effect
(5) Electron Diffraction
(6) Bell's Poor Inequality
randomness

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spectra

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inequality