

Postulates of Quantum Mechanics

There are five postulates of Q.M.

1.) State of QUANTUM Mechanical System: —

A Q.M state is defined by $|\psi\rangle$.
i.e. its function is square integrable.
↓
which is interact with whom.

Obviously, (this function) Q.M system which is defined by $|\psi\rangle$ and these are member of Hilbert space.

$|\psi(x)\rangle \Rightarrow$ Hilbert space.

1st postulates — Linear Superposition of State is also state of system.

If $|\psi_1\rangle$ is state of system and $|\psi_2\rangle$ is also state of system. Then we will say that

$$|\psi\rangle = a_1|\psi_1\rangle + a_2|\psi_2\rangle$$

Postulates 2 - Operator And Observable

For every physical measurable or observable quantity, there must associated an operator and operator associated with this physical quantity must be hermitian.

The measurement of these physical quantity on any state is Eigen value of that operator. Hence the operator associated with physical quantities are hermitian. So Eigen values or measurement of state will always real. The Eigen vector corresponds to Eigen values is known as Eigen state of a system. And these Eigen state will make the complete basis. ($\sum_i |\phi_i\rangle\langle\phi_i| = I$, They are orthonormal & independent.)

Any state can be written in a basis of orthonormal set of Eigen state.

A state cannot be always a state But Eigen state is always a state.