Assignment-1

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Quantum Mechanics

Physics (H) – 5th Sem (2023 September)

1	Why should the wave function f(x) be a single valued every where?
2	Explain the meaning of well behaved wave function.
3	What is a wave function associated with a free particle?
4	What is a free particle?
5	Explain Born's interpretation of wave function.
6	What are the conditions that a wave function must obey?
7	What do you mean by normalization of a wave function.
8	Write down time dependent Schrodinger wave function.
9	What are the properties of the wave function.
10	What do you mean by expectation value of an observable.
11	What is probability current density.
12	What do you mean by linearity.
13	State superposition principle
14	Write down the relation between linear momentum and propagation constant.
15	Discuss limitation of free particle wave function.
16	What is the de-Broglie's wave length of an electron travelling with a speed of 3×10^6 m/sec.
17	Define wave packet.
18	Why material particle cannot be represented by a single wave?
19	What is an operator.
20	What is eigen value and eigen function of an operator.
21	What are the conditions for a linear operator.
22	What is momentum operator.
23	What is energy operator.
24	What is Hamiltonian operator.
25	Define commutator.
26	What do you mean by Hermitian operator.
27	Write down the properties of Hermitian operator.
28	Show that the momentum operator is hermitian.
29	What do you mean by adjoint of an operator.
30	Explain eigen value spectrum & simultaneous eigen functions