

Main Topics in Quantum Mechanics

2024 Refresher Course — Hyderabad University

A K Kapoor

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1. Postulates of Quantum Mechanics
 - 1.1 The Structure of Physical Theories
 - 1.2 Why Postulates ?
 - 1.3 Postulates of QM
 - 1.4 Exercise-01
 - 1.5 Exercise-02
2. The Density matrix
3. Time Independent Perturbation Theory
 - ⟨i⟩ An Overview
 - ⟨ii⟩ Nondegenerate level - 1st Order
 - ⟨iii⟩ Nondegenerate level - 2nd order
 - ⟨iv⟩ Degenerate Levels - 1st order
 - ⟨v⟩ Degenerate Levels - 2nd Order
 - ⟨vi⟩ Degenerate Levels — How to Choose Unperturbed States
 - ⟨vii⟩ Solving Problems in Time Independent Perturbation Theory
4. Problems/Solutions
 - ⟨i⟩ Second Order Correction to Ground State Energy is Negative
 - ⟨ii⟩ Charged Harmonic Oscillator
 - ⟨iii⟩ A matrix problem having both degenerate and non degenerate levels
 - ⟨iv⟩ A matrix problem having both degenerate and non degenerate levels