

NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Physics - NOC: Introductory Quantum Mechanics

Subject Co-ordinator - Prof. Manoj K Harbola

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Black Body Radiation I - Relevant Definitions and Black Body as cavity
- Lecture 2 - Black Body Radiation II - Intensity of radiation in terms of energy density
- Lecture 3 - Black Body Radiation III - Spectral energy density and radiation pressure inside a black body rad
- Lecture 4 - Black Body Radiation IV - Stephen's Boltzman law
- Lecture 5 - Black Body Radiation V - Wein's Displacement law and analysis for spectral density
- Lecture 6 - Black Body Radiation VI - Wein's distribution law and rayleigh - Jeans distribution law
- Lecture 7 - Black Body Radiation VII - Quantum Hypothesis and plank's distribution Formula
- Lecture 8 - Radiation as a collection of particles called photons
- Lecture 9 - Quantum Hypothesis and specific heat of solids
- Lecture 10 - Bohr's Model of hydrogen spectrum
- Lecture 11 - Wilson Sommerfeld quantum condition I - Harmonic oscillator and particle in a box
- Lecture 12 - Wilson Sommerfeld quantum condition II - Particle moving in a coulomb potential in a plane and r
- Lecture 13 - Wilson Sommerfeld quantum condition III - Particle moving in a coulomb potential in 3D and relat
- Lecture 14 - Quantum conditions and atomic structure, electron spin and Pauli exclusion principle
- Lecture 15 - Interaction of atoms with radiation
- Lecture 16 - Stimulated emission and amplification of light in a LASER
- Lecture 17 - Brief description of a LASER
- Lecture 18 - Introduction to the correspondence principle
- Lecture 19 - General nature of the correspondence principle
- Lecture 20 - Selection rules (for transitions) through the correspondence principle
- Lecture 21 - Applications of the correspondence principle
- Lecture 22 - Heisenberg's formulations of quantum mechanics
- Lecture 23 - Heisenberg's formulation of quantum mechanics
- Lecture 24 - Heisenberg's formulation of the quantum mechanics
- Lecture 25 - Brief introduction to matrix mechanics and the quantum condition in matrix form
- Lecture 26 - Introduction to waves and wave equation
- Lecture 27 - Stationary waves eigen values and eigen functions
- Lecture 28 - Matter waves and their experimental detection
- Lecture 29 - Representing a moving particle by a wave packet

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- Lecture 30 - Stationary-state Schrodinger equation and its solution for a particle in a box
- Lecture 31 - Solution of the stationary-state Schrodinger equation for a simple harmonic oscillator
- Lecture 32 - Equivalence of Heisenberg and the Schrodinger formulations
- Lecture 33 - Equivalence of Heisenberg and Schrodinger formulations
- Lecture 34 - Born interpretation of the wavefunction and expectation values of x and p operators
- Lecture 35 - Uncertainty principle and its simple applications
- Lecture 36 - Time dependent Schrodinger equation the probability current density and the continuity equation
- Lecture 37 - Ehrenfest theorem for the expectation values of x and p operators
- Lecture 38 - Solution of Schrodinger equation for a particle in one and two delta function potentials
- Lecture 39 - Solution of Schrodinger equation for a particle in a finite well
- Lecture 40 - Numerical solution of a one dimensional Schrodinger equation for bound states - I
- Lecture 41 - Numerical solution of a one dimensional Schrodinger equation for bound states - II
- Lecture 42 - Reflection and transmission of particles across a potential barrier
- Lecture 43 - Quantum-tunneling and its examples
- Lecture 44 - Solution of the Schrodinger for free particles and periodic boundary conditions
- Lecture 45 - Electrons in a metal
- Lecture 46 - Schrodinger equation for particles in spherically symmetric potential, angular momentum operator
- Lecture 47 - Angular momentum operator and its eigenfunctions
- Lecture 48 - Equation for radial component of the wavefunction in spherically symmetric potentials and general
- Lecture 49 - Solution for radial component of the wavefunction for the hydrogen atom
- Lecture 50 - Numerical solution for the radial component of wavefunction for spherically symmetric potentials
- Lecture 51 - Solution of the Schrodinger equation for one dimensional periodic potential
- Lecture 52 - Kroning-Penny model and energy bands
- Lecture 53 - Kroning-Penny model with periodic Dirac delta function and energy bands
- Lecture 54 - Discussion on bands
- Lecture 55 - Summary of the course