Name of Assistant/Associate Professor:-Ms. Pooja
Class:-B.Sc. I Subject:-Physics
Lesson Plan: 13 weeks (from Sept. 2023 to Dec. 2023)

Week 1 Chapter 1 :Prerequisites
Assignments
• Rigid body, Moment of Inertia • Radius of Gyration • Theorems of perpendicular and parallel axis (with proof) • Moment of Inertia of ring, Disc, Angular Disc, • Moment of Inertia of Solid cylinder, Solid sphere, Hollow sphere
Week 2 Chapter 1 :Prerequisites
Assignments
• Moment of Inertia of Rectangular plate, Square plate, Solid cone, • Moment of Inertia of Triangular plate, • Torque, Rotational Kinetic Energy, Angular momentum, • Law of conservation of angular momentum, • Rolling motion, condition for pure rolling
Week 3 Chapter 1 and 2:Prerequisites
Assignments
• acceleration of body rolling down an inclined plane, • Fly wheel, • Moment of Inertia of an irregular body. • Deforming force, Elastic limit, • stress, strain and their types, • Hooke's law,
Week 4 Chapter 2 :Prerequisites
Assignments
• Modulus of rigidity, Relation between shear angle and angle of twist, • elastic energy stored/volume in an elastic body, • Elongation produced in heavy rod due to its own weight and elastic potential energy stored in it, • Tension in rotating rod,
Week 5 Chapter 2 :Prerequisites
Assignments
• Poisson's ratio and its limiting value, • Elastic Constants and their relations. • Torque required for twisting cylinder, • Hollow shaft is stiffer than solid one.
Week 6 Chapter 2 :Prerequisites

Assignments
• Bending of beam, bending moment and its magnitude, • Flexural rigidity, Geometrical moment of inertia for beam of rectangular cross-section and circular cross-section. • Bending of cantilever (loaded by a weight W at its free end), • weight of cantilever uniformly distributed over its entire length.
Week 7 **Chapter 2 :Prerequisites**
Assignments
• Dispersion of a centrally loaded beam supported at its ends, • determination of elastic constants for material of wire by Searle's method. • Revision • Problems by students
Week 8 **Chapter 3:Prerequisites**
Assignments
• Michelson's Morley experiment and its outcomes, • Postulates of special theory of relativity, • Lorentz Transformations, • Simultaneity and order of events, • Lorentz contraction, • Time dilation,
Week 9 **Chapter 3:Prerequisites**
Assignments
• Relativistic transformation of velocity, • relativistic addition of velocities, • variation of mass-energy equivalence, • elativistic Doppler effect, • relativistic kinematics
Week 10 **Chapter 3 :Prerequisites**
Assignments
• transformation of energy and momentum, • transformation of force, • Problems of relativistic dynamics. • Revision • Problems by students
Week 11 **Chapter 4 :Prerequisites**
Assignments
• : Law of gravitation, • Potential and field due to spherical shell and solid sphere. • Motion of a particle under central force field, • Two body problem and its reduction to one body problem and its solution,
Week 12 **Chapter 4 :Prerequisites**
Assignments

• compound pendulum or physical pendulum in form of elliptical lamina and expression of time period, • determination of g by means of bar pendulum, • Normal coordinates and normal modes, • Normal modes of vibration for given spring mass system,
Week 13 Chapter 4 :Prerequisites
Assignments • possible angular frequencies of oscillation of two identical simple pendulums of length (l) and small bob of mass (m0 joined together with spring of spring constant • Problems • Revision • Complete Syllabus Test

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Name of Assistant/Associate Professor:- Ms. Pooja
Class:- B.Sc. 1st **Subject:- Physics**
Paper:- Electricity, Magnetism and EM Theory
Period of Lesson Plan:- 16 weeks (Feb 2024 to May 2024)

Week 1 **Chapter 1 : Prerequisites** **Assignments** • **Gradient of a scalar and its physical significance,** • **Line, Surface and Volume integrals of a vector and their physical significance,** • **Flux of a vector field,** • **Divergence and curl of a vector and their physical significance,**
Week 2 **Chapter 1 : Prerequisites** **Assignments** • **Gauss's divergence theorem,** • **Stoke's theorem.** • **Conservative nature of Electrostatic Field,** • **Electrostatic Potential,**
Week 3 **Chapter 1 :Prerequisites** **Assignments** • **Potential as line integral of field,** • **potential difference** • **Derivation of electric field E from potential as gradient.** • **Derivation of Laplace and Poisson equations.**
Week 4 **Chapter 1 :Prerequisites** **Assignments** • **Electric flux, Gauss's Law,** • **Differential form of Gauss's law and applications of Gauss's law.** • **Mechanical force of charged surface,** • **Energy per unit volume** • **Revision** • **Problem by students**
Week 5 **Chapter 2 :Prerequisites** **Assignments** • **Biot-Savart law** • **its simple applications: straight wire and circular loop,** • **Current Loop as a Magnetic Dipole** • **its Dipole Moment,** • **Ampere's Circuital Law**

Week 6
Chapter 2 :Prerequisites
Assignments

- **Applications of Ampere's Circuital Law to**
- **(1) Solenoid and**
- **(2) Toroid,**
- **properties of B: curl and divergence,**
- **Magnetic Properties of Matter:**

Week 7
Chapter 2:Prerequisites
Assignments

- **Force on a dipole in an external field,**
- **Electric currents in Atoms,**
- **Electron spin and Magnetic moment,**
- **types of magnetic materials,**
- **Magnetization vector (M), Magnetic Intensity (H),**

Week 8
Chapter 2 : Prerequisites
Assignments

- **Magnetic Susceptibility and permeability,**
- **Relation between B, H and M, Electronic**
- **theory of dia and paramagnetism,**
- **Domain theory of ferromagnetism (Langevin's theory),**

Week 9
Chapter 2 : Prerequisites
Assignments

- **Cycle of Magnetization-**
- **B-H curve and hysteresis loop: Energy dissipation,**
- **Hysteresis loss**
- **importance of Hysteresis Curve**
- **Revision**
- **Problem by students**

Week 10
Chapter 3 : Prerequisites
Assignments

- **Electromagnetic induction,**
- **Faraday's laws of induction**
- **Lenz's Law,**
- **Self-inductance,**
- **Mutual inductance,**

Week 11 Paper-2
Chapter 3 :- Prerequisites
Assignments

- **Energy stored in a Magnetic field,**
- **Derivation of Maxwell's equations,**
- **Displacement current,**

Week 12
Chapter 3:- Prerequisites
Assignments

- Maxwell's equations in differential and integral form and their physical significance.
- Electromagnetic waves,
- Transverse nature of electromagnetic wave,
- energy transported by electromagnetic waves,

Week 13
Chapter 3:- Prerequisites
Assignments

- Poynting vector,
- Poynting's theorem.
- Propagation of Plane electromagnetic waves in free space & Dielectrics
- Revision
- Problem by students

Week 14
Chapter 4:- Prerequisites
Assignments

- DC current Circuits
- Electric current and current density,
- Electrical conductivity and Ohm's law (Review),
- Kirchhoff's laws for D.C. networks,

Week 15
Chapter 4 :- Prerequisites
Assignments

- Network theorems: Thevenin's theorem,
- Norton theorem,
- Superposition theorem.
- Alternating Current Circuits: A resonance circuit,
- Phasor,

Week 16
Chapter 4 :- Prerequisites
Assignments

- Complex Reactance and Impedance,
- Analysis for RL, RC and LC Circuits,
- Series LCR Circuit: (1) Resonance, (2) Power Dissipation
- (3) Quality Factor and (4) Band Width,
- Parallel LCR Circuit.
- Unit test

Name of Assistant/Associate Professor:-Ms. Anuj
Class:-B.Sc. I Subject:-Physics
Lesson Plan: 13 weeks (from Sept. 2023 to Dec. 2023)

Week 1 Chapter 1 :Prerequisites
Assignments • Rigid body, Moment of Inertia • Radius of Gyration • Theorems of perpendicular and parallel axis (with proof) • Moment of Inertia of ring, Disc, Angular Disc, • Moment of Inertia of Solid cylinder, Solid sphere, Hollow sphere
Week 2 Chapter 1 :Prerequisites
Assignments • Moment of Inertia of Rectangular plate, Square plate, Solid cone, • Moment of Inertia of Triangular plate, • Torque, Rotational Kinetic Energy, Angular momentum, • Law of conservation of angular momentum, • Rolling motion, condition for pure rolling
Week 3 Chapter 1 and 2:Prerequisites
Assignments • acceleration of body rolling down an inclined plane, • Fly wheel, • Moment of Inertia of an irregular body. • Deforming force, Elastic limit, • stress, strain and their types, • Hooke's law,
Week 4 Chapter 2 :Prerequisites
Assignments • Modulus of rigidity, Relation between shear angle and angle of twist, • elastic energy stored/volume in an elastic body, • Elongation produced in heavy rod due to its own weight and elastic potential energy stored in it, • Tension in rotating rod,
Week 5 Chapter 2 :Prerequisites
Assignments • Poisson's ratio and its limiting value, • Elastic Constants and their relations. • Torque required for twisting cylinder, • Hollow shaft is stiffer than solid one.
Week 6 Chapter 2 :Prerequisites

Assignments
• Bending of beam, bending moment and its magnitude, • Flexural rigidity, Geometrical moment of inertia for beam of rectangular cross-section and circular cross-section. • Bending of cantilever (loaded by a weight W at its free end), • weight of cantilever uniformly distributed over its entire length.
Week 7 Chapter 2 :Prerequisites
Assignments • Dispersion of a centrally loaded beam supported at its ends, • determination of elastic constants for material of wire by Searle's method. • Revision • Problems by students
Week 8 Chapter 3:Prerequisites
Assignments • Michelson's Morley experiment and its outcomes, • Postulates of special theory of relativity, • Lorentz Transformations, • Simultaneity and order of events, • Lorentz contraction, • Time dilation,
Week 9 Chapter 3:Prerequisites
Assignments • Relativistic transformation of velocity, • relativistic addition of velocities, • variation of mass-energy equivalence, • elativistic Doppler effect, • relativistic kinematics
Week 10 Chapter 3 :Prerequisites
Assignments
• transformation of energy and momentum, • transformation of force, • Problems of relativistic dynamics. • Revision • Problems by students
Week 11 Chapter 4 :Prerequisites
Assignments
• : Law of gravitation, • Potential and field due to spherical shell and solid sphere. • Motion of a particle under central force field, • Two body problem and its reduction to one body problem and its solution,
Week 12 Chapter 4 :Prerequisites
Assignments

• compound pendulum or physical pendulum in form of elliptical lamina and expression of time period, • determination of g by means of bar pendulum, • Normal coordinates and normal modes, • Normal modes of vibration for given spring mass system,
Week 13 Chapter 4 :Prerequisites
Assignments
• possible angular frequencies of oscillation of two identical simple pendulums of length (l) and small bob of mass (m0 joined together with spring of spring constant • Problems • Revision • Complete Syllabus Test

Name of Assistant/Associate Professor:- Ms. Anuj
Class:- B.Sc. 1st **Subject:- Physics**
Paper:- Electricity, Magnetism and EM Theory
Period of Lesson Plan:- 16 weeks (Feb 2024 to May 2024)

Week 1 **Chapter 1 : Prerequisites** **Assignments** • Gradient of a scalar and its physical significance, • Line, Surface and Volume integrals of a vector and their physical significance, • Flux of a vector field, • Divergence and curl of a vector and their physical significance,
Week 2 **Chapter 1 : Prerequisites** **Assignments** • Gauss's divergence theorem, • Stoke's theorem. • Conservative nature of Electrostatic Field, • Electrostatic Potential,
Week 3 **Chapter 1 :Prerequisites** **Assignments** • Potential as line integral of field, • potential difference • Derivation of electric field E from potential as gradient. • Derivation of Laplace and Poisson equations.
Week 4 **Chapter 1 :Prerequisites** **Assignments** • Electric flux, Gauss's Law, • Differential form of Gauss's law and applications of Gauss's law. • Mechanical force of charged surface, • Energy per unit volume • Revision • Problem by students
Week 5 **Chapter 2 :Prerequisites** **Assignments** • Biot-Savart law • its simple applications: straight wire and circular loop, • Current Loop as a Magnetic Dipole • its Dipole Moment, • Ampere's Circuital Law

Week 6
Chapter 2 :Prerequisites
Assignments

- Applications of Ampere's Circuital Law to
- (1) Solenoid and
- (2) Toroid,
- properties of B: curl and divergence,
- Magnetic Properties of Matter:

Week 7
Chapter 2:Prerequisites
Assignments

- Force on a dipole in an external field,
- Electric currents in Atoms,
- Electron spin and Magnetic moment,
- types of magnetic materials,
- Magnetization vector (M), Magnetic Intensity (H),

Week 8
Chapter 2 : Prerequisites
Assignments

- Magnetic Susceptibility and permeability,
- Relation between B, H and M, Electronic
- theory of dia and paramagnetism,
- Domain theory of ferromagnetism (Langevin's theory),

Week 9
Chapter 2 : Prerequisites
Assignments

- Cycle of Magnetization-
- B-H curve and hysteresis loop: Energy dissipation,
- Hysteresis loss
- importance of Hysteresis Curve
- Revision
- Problem by students

Week 10
Chapter 3 : Prerequisites
Assignments

- Electromagnetic induction,
- Faraday's laws of induction
- Lenz's Law,
- Self-inductance,
- Mutual inductance,

Week 11 Paper-2
Chapter 3 :- Prerequisites
Assignments

- Energy stored in a Magnetic field,
- Derivation of Maxwell's equations,
- Displacement current,

Week 12 **Chapter 3:- Prerequisites** **Assignments** • **Maxwell's equations in differential and integral form and their physical significance.** • **Electromagnetic waves,** • **Transverse nature of electromagnetic wave,** • **energy transported by electromagnetic waves,**
Week 13 **Chapter 3:- Prerequisites** **Assignments** • **Poynting vector,** • **Poynting's theorem.** • **Propagation of Plane electromagnetic waves in free space & Dielectrics** • **Revision** • **Problem by students**
Week 14 **Chapter 4:- Prerequisites** **Assignments** • **DC current Circuits** • **Electric current and current density,** • **Electrical conductivity and Ohm's law (Review),** • **Kirchhoff's laws for D.C. networks,**
Week 15 **Chapter 4 :- Prerequisites** **Assignments** • **Network theorems: Thevenin's theorem,** • **Norton theorem,** • **Superposition theorem.** • **Alternating Current Circuits: A resonance circuit,** • **Phasor,**
Week 16 **Chapter 4 :- Prerequisites** **Assignments** • **Complex Reactance and Impedance,** • **Analysis for RL, RC and LC Circuits,** • **Series LCR Circuit: (1) Resonance, (2) Power Dissipation** • **(3) Quality Factor and (4) Band Width,** • **Parallel LCR Circuit.** • **Unit test**

Name of Assistant/Associate Professor:- Mr. Rajesh Kumar
Class :- B.Sc. III (Sec. A and Sec. B) Subject:- Physics (Paper 1)
Subject Lesson Plan: 13 weeks (from Sep. 2023 to Dec. 2023)

Week 1 **Chapter 1 :Prerequisites**
Assignments
• Boundary between classical and quantum • Photoelectric effect • Compton effect • Frank Hertz Experiment • De-Broglie hypothesis • Davisson Germer exp.
Week 2 **Chapter 1 :Prerequisites**
• Phase velocity , Group velocity • Heisenberg's Uncertainty Principle • Gamma Ray Microscope • Electron Diffraction from a Slit
Week 3 **Chapter 1 :Prerequisites**
• Derivation of Schrodinger Wave Equation • Eigen Value ,Eigen Function and Significance • Orthogonality and Normalisation of Function
Week 4 **Chapter 1 :Prerequisites**
• Concept of Observable and Operator • Expectation Value of Dynamical Quantities • Probability Current Density
Week 5 **Chapter 1& 2 :Prerequisites**
• Probability Current Density • Revision of Unit • Free Particle in One Dimensional Box
Week 6 **Chapter 2 :Prerequisites** • Nodes and Antinodes ,Zero Point Energy • One Dimensional Step Potential $E>V_0$ • One Dimensional Step Potential $E<V_0$
Week 7 **Chapter 2 :Prerequisites**

- One Dimensional Potential Barrier $E>V_0$
- One Dimensional Potential Barrier $E<V_0$

Week 8
Chapter 2 :Prerequisites

- Quantisation of Energy for Harmonic Oscillator
- Zero Point Energy, Wave Equation for Harmonic Oscillator
- Revision of 2nd unit

Week 9
Chapter 3 :Prerequisites

- Basic Concepts of Laser
- Features of Laser: Degree of Coherence
- Spatial and Temporal Coherence

Week 10
Chapter 3 :Prerequisites

- Einstein's Coefficients
- Possibility of Amplification
- Momentum Transfer
- Life Time of a Level
- Kinetics of Optical Absorption

Week 11
Chapter 3 :Prerequisites

- Population Inversion
- Resonance Cavity
- Laser Pumping
- Threshold Condition for Laser Emission
- Line Broadening Mechanism

Week 12
Chapter 3 :Prerequisites

- Homogeneous Line Broadening
- Inhomogeneous Line Broadening
- Revision of Unit
- Working of He Ne Laser

Week 13
Chapter 4 :Prerequisites

Assignments

- RUBY Laser
- Construction and Working of Semiconductor Laser
- Applications of Lasers
- Revision

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Name of Assistant/Associate Professor: - Mr. Rajesh Kumar
Class: - B.Sc. III (Sec. A and Sec. B) **Subject:- Physics (Paper 2)**
Subject Lesson Plan: 16 weeks (from Feb 2024 to May 2024)

Week 1 **Chapter 1 :Prerequisites**
• Historical background of atomic spectroscopy Introduction of early observations, • emission and absorption spectra, • atomic spectra, wave number, • spectrum of Hydrogen atom in Balmer series, • Bohr atomic model(Bohr's postulates).
Week 2 **Chapter 1 :Prerequisites**
• spectra of Hydrogen atom , • explanation of spectral series in Hydrogen atom, • un-quantized states and continuous spectra, • spectral series in absorption spectra,
Week 3 **Chapter 1 :Prerequisites**
• effect of nuclear motion on line spectra (correction of finite nuclear mass), • variation in Rydberg constant due to finite mass, • short comings of Bohr's theory, • Wilson sommerfeld quantization rule, • de-Broglie interpretation of Bohr quantization law.
Week 4 **Chapter 1 :Prerequisites**
• Wilson sommerfeld quantization rule, • de-Broglie interpretation of Bohr quantization law. • Bohr's corresponding principle,
Week 5 **Chapter 1:Prerequisites**
• Bohr's corresponding principle, • Sommerfeld's extension of Bohr's model, • Sommerfeld relativistic correction, • Short comings of Bohr-Sommerfeld theory,
Week 6 **Chapter 2:Prerequisites**
• Vector atom model; • space quantization, • electron spin, • coupling of orbital and spin angular momentum,
Week 7 **Chapter 1:Prerequisites**
• spectroscopic terms and their notation, • quantum numbers associated with vector atom model, • transition probability and selection rules.

Week 8 **Chapter 2 :Prerequisites**
• Vector Atom Model (single valance electron) Orbital magnetic dipole moment (Bohr megnaton), • behavior of magnetic dipole in external magnetic field; • Larmors' precession and theorem. • Penetrating and Non-penetrating orbits, • Penetrating orbits on the classical model;
Week 9 **Chapter 2 :Prerequisites**
• Quantum defect, • spin orbit interaction energy of the single valance electron, • spin orbit interaction for penetrating and non-penetrating orbits.
Week 10 **Chapter 2 :Prerequisites**
• quantum mechanical relativity correction, • Hydrogen fine spectra, • Main features of Alkali Spectra and their theoretical interpretation, term series and limits, Rydeburg-Ritze combination principle, • Absorption spectra of Alkali atoms. Observed doublet fine structure in the spectra of alkali metals and its Interpretation, • Intensity rules for doublets, comparison of Alkali spectra and Hydrogen Spectrum.
Week 11 **Chapter 3 :Prerequisites**
• Vector Atom model (two valance electrons) : • Essential features of spectra of Alkaline-earth elements, • Vector model for two valance electron atom: application of spectra. • Coupling Schemes; LS or Russell – Saunders Coupling Scheme and JJ coupling scheme, Interaction energy in L-S coupling (sp, pd configuration),
Week 12 **Chapter 3 :Prerequisites**
• Lande interval rule, Pauli principal and periodic classification of the elements. • Interaction energy in JJ Coupling (sp, pd configuration), • equivalent and non-equivalent electrons, • Two valance electron system-spectral terms of non-equivalent and equivalent electrons,
Week 13 **Chapter 3:Prerequisites**
• comparison of spectral terms in L-S And J-J coupling. • Hyperfine structure of spectral lines and its origin; • isotope effect, nuclear spin.
Week 14 **Chapter 4 :Prerequisites**
• Atom in External Field Zeeman Effect (normal and Anomalous), • Experimental set-up for studying Zeeman effect, • Explanation of normal Zeeman effect(classical and quantum mechanical), • Explanation of anomalous Zeeman effect(Lande g-factor),
Week 15 **Chapter 4 :Prerequisites**

- Zeeman pattern of D1 and D2 lines of Na atom,
- Paschen-Back effect of a single valence electron system.
- Weak field Stark effect of Hydrogen atom

Week 16

Chapter 4 :Prerequisites

- Molecular Physics General Considerations,
- Electronic States of Diatomic Molecules,
- Rotational Spectra (Far IR and Microwave Region),
- Vibrational Spectra (IR Region), Rotator Model of Diatomic Molecule, Raman Effect, Electronic Spectra.

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Name of Assistant/Associate Professor:- Dr. Rajiv Chahal
Class :- B.Sc. III (Sec. A and Sec. B) Subject:- Physics (Paper 2)
Subject Lesson Plan: 13 weeks (from Sep. 2023 to Dec. 2023)

Week 1 **Chapter 1 :Prerequisites**
Assignments • **Nuclear composition** • **Various Properties of Nuclei**
Week 2 **Chapter 1 :Prerequisites**
Assignments • **Magnetic dipole and quadruple moment** • **Bain- Bridge mass spectrograph**
Week 3 **Chapter 1 and 2 :Prerequisites**
Assignments • **Bain-Bridge and Jordan mass spectrograph, Mosely law** • **Revision of unit** • **Heavy charge particle interaction with matter**
Week 4 **Chapter 2 :Prerequisites**
Assignments • **Range and straggling of charged particle** • **Light charge particle and gamma rays interaction with matter** • **gamma rays interaction with matter**
Week 5 **Chapter 2 :Prerequisites**
Assignments • **Compton scattering and pair production** • **Absorption of Gamma rays** • **Range energy, Velocity of Alpha particles**
Week 6 **Chapter 2 :Prerequisites**
Assignments • **Alpha Disintegration** • **Energy of Alpha and Beta decay** • **Beta particle spectrometer**
Week 7 **Chapter 2 :Prerequisites**
Assignments • **Beta particle spectrometer** • **Revision of 2nd unit**
Week 8 **Chapter 3 :Prerequisites**

Assignments • Class Test of unit 1 and 2 • Types of Nuclear Reactions • Conservation law and Q value of reactions
Week 9 Chapter 3 :Prerequisites
Assignments • Exoergic and endoergic reactions • Nuclear fission and chain reactions • Nuclear Reactor
Week 10 Chapter 3 :Prerequisites
Assignments • Nuclear fusion • Van De Graff accelerator • Tandam Accelerator
Week 11 Chapter 3 :Prerequisites
Assignments • Revision of Particle accelerator • Linear accelerator • Cyclotron • Betatron
Week 12 Chapter 3 :Prerequisites
Assignments • Gas filled detector • Ionization chamber • Proportional counter
Week 13 Chapter 3 :Prerequisites
Assignments • Geiger-Mullar counter • Scintillation Counter • Semiconductor Detectors

Name of Assistant/Associate Professor:- Dr. Rajiv Chahal

Class:- B.Sc. 3rd (Sec. A & B) **Subject:- Physics**

Paper:- Soild State and Nano Physics (Paper I)

Period of Lesson Plan:- 16 weeks (Feb. 2024 to May 2024)

Week 1 Chapter 1 :- Prerequisites Assignments • Crystalline and Glassy form, Liquid crystals • Crystal Structures, Periodicity and Unit cell
Week 2 Chapter 1 :Prerequisites Assignments • Lattice and Basis crystal translational vectors and axes • Wigner Seitz Primitive cells
Week 3 Chapter 1 :Prerequisites Assignments • Symmetry operations for two dimension crystal • Crystal bravais lattice in two and three dimension • Crystal Plane and Miller Indices
Week 4 Chapter 1 :Prerequisites Assignments • Interplanar Spacing • Crystal structure of ZnS • Crystal Structure of NaCl
Week 5 Chapter 1 :Prerequisites Assignments • Crystal Structure of diamond • Unit Test
Week 6 Chapter 2 :Prerequisites Assignments • X-ray diffraction • Bragg's Law and experimental X-ray diffraction method • K-space
Week 7 Chapter 2 :Prerequisites Assignments • Reciprocal lattice and its physical significance • Reciprocal Lattice vector • Reciprocal lattice to simple cubic lattice
Week 8 Chapter 2 :Prerequisites Assignments • Reciprocal Lattice to BCC • Reciprocal lattice to FCC • Unit Test

Week 9
Chapter 3 :Prerequisites
Assignments
- Historical introduction of Superconductivity
- Survey of Superconductivity
- Superconducting system

Week 10
Chapter 3 :Prerequisites
Assignments
- High Tc Superconductor
- Isotopic Effect
- Critical magnetic field

Week 11
Chapter 3 :Prerequisites
Assignments
- Meissner Effect
- London Theory and Peppard equation
- Classification of Superconductors
- BCS theory

Week 12
Chapter 3:Prerequisites
Assignments
- Josephson Effect
- Practical applications of Superconductivity
- Power application of Superconductors
- Unit test

Week 13
Chapter 4 :Prerequisites
Assignments
- Definition of Nanophysics
- Length scale
- Importance of Nanoscale and technology

Week 14
Chapter 4 :Prerequisites
Assignments
- History of Nanotechnology
- Benefit and challenge in molecular manufacturing

Week 15
Chapter 4 :Prerequisites
Assignments
- Molecular assembler concept Optical fibres
- Understanding advanced capability
- Vision and objective of nanotechnology
- Nanotechnology in different field

Week 16
Chapter 4 :Prerequisites
Assignments
- Nanotechnology in Automobiles
- Nanotechnology in electronics, biotechnology, material and medicine
- Unit test

Name of Assistant/Associate Professor:-Mr. Amit Dhiman
Class:-B.Sc. II **Subject:-Physics (Paper 1)**
Lesson Plan: 13 weeks (from Sept. 2023 to Dec. 2023)

Week 1 **Chapter 1 :Prerequisites**
Assignments
• **Binary representation** • **Algorithm development** • **Flowcharts and their interpretation**
Week 2 **Chapter 1 :Prerequisites**
Assignments
• **Fortran preliminaries** • **Executable and non-executable statement**
Week 3 **Chapter 1 :Prerequisites**
Assignments
• **Input and output statements** • **formats** • **IF statement**
Week 4 **Chapter 1 :Prerequisites**
Assignments
• **DO statement** • **GO TO statement** • **Dimension and array** • **Statement function and function subprogram**
Week 5 **Chapter 2 :Prerequisites**
Assignments
• **Fortran program development** • **Fortran Programming** • **To Print all natural no. between given limit**
Week 6 **Chapter 2 :Prerequisites**
Assignments
• **Range of the set of given numbers** • **Ascending and descending order** • **Mean and standard deviation**
Week 7 **Chapter 2 :Prerequisites**
Assignments • **Least square fitting of curve** • **Roots of quadratic equation** • **Least square fitting of curve**

Week 8 **Chapter 2 :Prerequisites**
Assignments • **Product of two matrices** • **Trapozoidal Rule** • **Simpson 1/3 Rule** • **Revision** • **Problems by students**
Week 9
Assignments • **Test** • **Basics of Thermodynamics** • **Joule-Thomson effect and J-T porous plug experiment** • **Analytical treatment of J-T effect** • **Kelvin scale of temperature**
Week 10 **Chapter 3 :Prerequisites**
Assignments
• **Specific heat of saturated vapour** • **Entropy of a perfect gas** • **Derivation of latent heat equation**
Week 11 **Chapter 3 and 4 :Prerequisites**
Assignments
• **Phase diagram and triple point** • **Thermodynamical functions** • **Derivation of Maxwell thermodynamic relations**
Week 12 **Chapter 4 :Prerequisites**
Assignments
• **Relation b/w two specific heats of gas** • **Derivation of clausius-claperyon equation** • **Variation of intrinsic energy with volume**
Week 13 **Chapter 4 :Prerequisites**
Assignments
• **Derivation of Stefan's law** • **Adiabatic Compression and expansion of gas** • **Deduction of theory of J-T effect** • **Computer organization** • **Problems** • **Revision** • **Complete Syllabus Test**

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Name of Assistant/Associate Professor:- Mr. Amit
Class:- B.Sc. 2nd **Subject:- Physics**
Paper:- Statistical Physics (Paper I and II)
Period of Lesson Plan:- 16 weeks (Feb 2024 to May 2024)

Week 1 Chapter 1 : Prerequisites Assignments • Microscopic and macroscopic system, • events-mutually exclusive, dependent and independent • statistical Probability, A-priori probability and relations • Addition theorem of probability • Multiplication theorem of probability • Combinations possessing maximum probability
Week 2 Chapter 1 : Prerequisites Assignments • Combinations possessing minimum probability • Tossing of 2,3 and any number of coins • Concept of permutation and combination • Distribution of N distinguishable and indistinguishable particle in boxes of equal size • Micro and macro states • Thermodynamical probability • Constraints and accessible states
Week 3 Chapter 1 and 2 :Prerequisites Assignments • Statistical fluctuations • General distribution of distinguishable particles in compartment of different size • Condition of equilibirium between two system in thermal contact-β parameter • Relation between Entropy and probability • Postulates of statistical physics • Phase space • Division of phase space into cells
Week 4 Chapter 2 :Prerequisites Assignments • Three kinds of statistics • M.B statistics applied to ideal gas • Energy distribution law • Speed distribution law

Week 5
Chapter 2 :Prerequisites
Assignments

- Velocity distribution law
- Expression for av. Speed ,r.m.s speed
- Expression for r.m.s velocity, most probable velocity
- Mean energy for Maxwellian distribution
- Unit test- chapter 2
- Need for quantum statistics

Week 6
Chapter 3 :Prerequisites
Assignments

- Bose Einstein energy distribution law
- Applications of B.E statistics to plank radiation law, B.E gas
- Degeneracy and B.E condensation
- F.D energy distribution law, F.D gas and degeneracy

Week 7
Chapter 3 : Prerequisites
Assignments

- Fermi energy and Fermi temperature
- F.D statistics for electron gas in metals
- Zero point energy, Zero point pressure, Av. Speed of electrons at 0 K
- Specific heat anomaly of metal and its solution

Week 8
Chapter 3 and 4 : Prerequisites
Assignments

- M.B Distribution as a limiting case of B.E and F.D statistics
- Comparison of 3 statistics, Dulong and petit law
- Derivation of Dulong and petit law from classical physics
- Specific heat at low temperature

Week 9
Chapter 4 : Prerequisites
Assignments

- Einstein theory of specific heat, Criticism of Einstein theory
- Debye model of Specific heat of solid
- Shortcoming of Debye model
- Comparison of Einstein and Debye theory
- Unit test-chapter 3 & 4

Week 10 Paper-2
Chapter 1 :- Prerequisites
Assignments

- Polarization by Reflection, Refraction and Scattering
- Mauls law, Brewster law and Nicol Prism
- Huygens wave theory of double refraction
- Quarter and Half wave plates and analysis of polarized light
- Production and detection of (i) Plane polarized light
- (ii) Circularly polarized light (iii) Elliptically polarized light

Week 11
Chapter 1 and 2 :- Prerequisites
Assignments

- **Optical Activity and Specific Rotation**
- **Fresnel's theory of optical rotation**
- **Half shade polarimeter, Bi-Quartz polarimeter**
- **Fourier Theorem And Its Analysis, Evaluation of Fourier Coefficients**
- **Unit test**

Week 12
Chapter 2 :- Prerequisites
Assignments

- **Importance and Limitations of Fourier Theorem**
- **Even And Odd Function, Complex Form Of the Fourier Series**
- **Fourier Series Expansion, Fourier Series between (i) 0-2π (ii) $-\pi$ to π (iii) –L to L**
- **Application of Fourier Theorem for Analysis of Complex Waves**
- **Fourier Theorem for Triangular and Rectangular Waves**

Week 13
Chapter 2 and 3:- Prerequisites
Assignments

- **Fourier Theorem For Rectifiers**
- **Parseval identity for Fourier Series, Fourier Integrals, Fourier Transforms**
- **Properties of FourierTransforms, Fourier Transform For Evaluation of Integrals**
- **Fourier Transform for Solution Of Ordinary Differential Equations**
- **Fourier Transform for (i) $f(x) = e^{-x2/2}$ (ii) f(x) = 1 if x< a and 0 if x >a**

Week 14
Chapter 3 and 4 :- Prerequisites
Assignments

- **Matrix Methods in Paraxial optics**
- **Effects of Translation and Refraction**
- **Derivation of thin and thick lens formula**
- **Unit plane and Nodal plane**
- **System of thin lens, Aberration, Chromatic Aberration**
- **Spherical aberration and its remedies**

Week 15
Chapter 4 :- Prerequisites
Assignments

- **Coma aberration and its remedies, Astigmatism and remedies**
- **Distortion aberration and its remedies, Optical fibres**
- **Structure of optical fibre and mode of its propagation**
- **Critical angle of propagation**

Week1 6
Chapter 4 :- Prerequisites
Assignments

- **Acceptance angle, Numerical aperture**
- **Fractional refractive index, normalized frequency**
- **Types of Optical fibre, Pulse dispersion, Attenuation**
- **Fibre optics Communication, Applications of Optical fibres**
- **Unit test**