**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Odd Semester (For UG-PG - Ongoing Classes)**

**Session (2023-2024)**

**Class: B.Sc 5th Semester**   **Name of the Teacher: Suresh Kumar**

**Subject: Physics Period :2nd/6th**

**Paper : A&B Room No : 129**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 21-07-2023 to 22-07-2023 | Crystal structure: Symmetry operations for a two dimensional crystal  Concept of current and voltage sources, Thevenin’s theorem |
| Week 2 | 24-07-2023 to 28-07-2023 | Two dimensional Bravais lattices, Three dimensional Bravais lattices, Basic primitive cells  Norton’s theorem, sources conversion |
| Week 3 | 31-07-2023 to 05-08-2023 | Crystal planes and Miller indices  CRO, Block diagram, construction and principle of working |
| Week 4 | 07-08-2023 to 12-08-2023 | Diamond and NaCl structure  Use of CRO for frequency, time period |
| Week 5 | 14-08-2023 to 19-08-2023 | Crystal diffraction : Bragg’s Law, Determination of crystal structure  Special features of dual trace phase measurements |
| Week 6 | 21-08-2023 to 26-08-2023 | Laue equations, Reciprocal lattices of SC, BCC and FCC, Bragg’s law in reciprocal lattice  Energy band diagrams in semiconductors, direct and indirect semiconductors |
| Week 7 | 28-08-2023 to 02-09-2023 | Brillouin zones and its derivation in two dimensions  Formula to calculate position of Fermi level in p and n semiconductors, Barrier formation |
| Week 8 | 04-09-2023 to 09-09-2023 | Structure factor and atomic form factor  Energy band diagram of p-n junction, formula for depletion width, qualitative ideas of current flow mechanism in forward and reverse biased diode |
| Week 9 | 11-09-2023 to 16-09-2023 | Band Theory of solids, periodic potential and Bloch theorem,  V-I characteristics, static and dynamic resistance, depletion and diffusion capacitance, Zener diode, LED, photodiode and solar cell |
| Week 10 | 18-09-2023 to 23-09-2023 | Kronig-Penney model  Diode circuit, clipping circuits |
| Week 11 | 25-09-2023 to 30-09-2023 | Band gaps, band structures in conductors  Rectification: half wave, full wave and bridge rectifiers |
| Week 12 | 03-10-2023 to 07-10-2023 | Direct and indirect semiconductors and insulators  Filter circuits(C, L ), rectification efficiency and ripple factor in L, C filter, voltage regulation circuit using Zener diode voltage multiplier circuits |
| Week 13 | 09-10-2023 to 14-10-2023 | Free electron theory of metals in one dimension.  Filter circuits( LC and π-filters), ), rectification efficiency and ripple factor in LC and π-filters |
| **Mid Semester Exam (16th October 2023 – 21st October, 2023)** | | |
| Week 15 | 25-10-2023 to 27-10-2023 | Free electron theory of metals in three dimension.  BJT structure and working different currents in transistor, switching action, Characteristics of CB, CE and CC configuration, active, cut off and saturation region |
| Week 16 | 31-10-2023 to 04-11-2023 | Effective mass, drift current, mobility  Load line analysis of transistors, Q-point, transistor biasing and stabilization of operating point, fixed bias |
| Week 17 | 06-11-2023 to 11-11-2023 | Conductivity (carrier concentration and mobility of carriers) and their variation with temperature in semi-conductors  Collector to base bias, bias circuit with emitter resistor, voltage divider biasing circuit |
| Week 18 | 14-11-2023 to 18-11-2023 | Fermi level positions in intrinsic and extrinsic semiconductors , Wiedemann-Franz law, Hall effect in metals and semiconductors  Working and analysis of CE amplifier using h-parameters, current, voltage and power gain, input and output impedance, Class A, B and C amplifiers. |

**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Odd Semester (For UG-PG - Ongoing Classes)**

**Session (2023-2024)**

**Class: B.Sc 3rd Semester**   **Name of the Teacher: Rajwinder Singh**

**Subject: Physics Period :5th**

**Paper :\*A/\*\*C Room No : 129**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 21-07-2023 to 22-07-2023 | \*Basic ideas of Statistical Physics, Scope of Statistical Physics, basic ideas about probability,  \*\*Plancks’s formula of Black body radiation. |
| Week 2 | 24-07-2023 to 28-07-2023 | \*Distribution of four distinguishable particles in two compartments of equal size.  \*\*Black body radiation and energy quantization |
| Week 3 | 31-07-2023 to 05-08-2023 | \*Concept of macrostates, microstates, thermodynamic probability, effects of constraints on the system,  \*\*Wave-particle duality – Photoelectric effect, X-ray diffraction, Compton effect, Pair production, Photon and gravity |
| Week 4 | 07-08-2023 to 12-08-2023 | \*Distribution of n particles in two compartments,  \*\*De Brogile waves, wave packet, Phase velocity and Group velocity, Electron microscope, Particle in a box |
| Week 5 | 14-08-2023 to 19-08-2023 | \*Deviation from the state of maximum probability, equilibrium state of dynamic system,.  \*\*Particle diffraction, Davisson-Germer experiment, Interferferometry with particles. |
| Week 6 | 21-08-2023 to 26-08-2023 | \*Distribution of distinguishable n particles in k compartments of unequal sizes  \*\*Uncertainty principle with illustrations, Principle of complementarity |
| Week 7 | 28-08-2023 to 02-09-2023 | \*Phase space and its division into elementary cells  \*\*Wave equation, Plausible arguments leading to time-dependent Schrodinger equations, Born’s interpretation of Wave function |
| Week 8 | 04-09-2023 to 09-09-2023 | \*Three kinds of statistics. The basic approach in the three statistics.  \*\*complex character, continuity and boundary conditions, probability interpretation, normalization, |
| Week 9 | 11-09-2023 to 16-09-2023 | \*Maxwell-Boltzman statistics applied to an ideal gas in equilibrium  \*\*Operator formalism, Position, momentum and energy operators, expectation values, Ehrenfest theorem, Hermitian operators. |
| Week 10 | 18-09-2023 to 23-09-2023 | \*Experimental verification of Maxwell-Boltzman’s law of distribution of molecular speeds.  \*\*Steady-state Schrodinger equation . |
| Week 11 | 25-09-2023 to 30-09-2023 | \*Need of quantum statistics--B.E. statistics  \*\*Potential step. potential barrier, Tunnel effect examples |
| Week 12 | 03-10-2023 to 07-10-2023 | \*Derivation of Planck’s law of radiation  \*\*Appliction to stationary states for one dimension Scanning Tunneling microscope, |
| Week 13 | 09-10-2023 to 14-10-2023 | \*\*Rectangular potential well, Linear harmonic oscillator. |
| **Mid Semester Exam (16th October 2023 – 21st October, 2023)** | | |
| Week 15 | 25-10-2023 to 27-10-2023 | \*Deduction of Wien’s displacement law and Stefan’s law from Planck’s law  \*\*SchrÖdinger equation for spherically symmetric potential, spherical harmonics |
| Week 16 | 31-10-2023 to 04-11-2023 | \*F.D. statistics  \*\*hydrogen atom energy levels and eigenfunctions, |
| Week 17 | 06-11-2023 to 11-11-2023 | \*Fermi dirac distribution law  \*\*Principal, Orbital and Magnetic quantum numbers , |
| Week 18 | 14-11-2023 to 18-11-2023 | \*Comparison of M.B., B.E. and F.D. statistics  \*\*Electron probability density |

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**Teaching Plan Odd Semester (For UG-PG - Ongoing Classes)**

**Session (2023-2024)**

**Class: B.Sc 5th Semester**  **Name of the Teacher: Dr. Harjeet Kaur**

**Subject: Nuclear Physics Period : 2nd (Wed) 6th(Thu)**

**Paper : C Room No : 129**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 21-07-2023 to 22-07-2023 | On Ex-India Leave |
| Week 2 | 24-07-2023 to 28-07-2023 | On Ex-India Leave |
| Week 3 | 31-07-2023 to 05-08-2023 | Introduction, Rutherford scattering Expt., Distance of closest approach |
| Week 4 | 07-08-2023 to 12-08-2023 | Constituents of nuclei, p-e theory, p-n theory, Nuclear Size, Nuclear Shapes, Nuclear mass, Nuclear Energy, Nuclear Density, Charge, Wave Mechanical properties, Parity, statistics, Angular Momentum, Magnetic Moment |
| Week 5 | 14-08-2023 to 19-08-2023 | Quadrupole moment, Isotopes, Isotones, Isobars, Nuclear Forces and its Properties, Mass defect, Packing Fraction, Binding energy and its curve |
| Week 6 | 21-08-2023 to 26-08-2023 | Analogy between drop of a liquid and nucleus, Fission Model, Liquid Drop Model, Assumptions, Binding Energy Terms |
| Week 7 | 28-08-2023 to 02-09-2023 | Failures and Success of LDM, Experimental evidence of Magic numbers. |
| Week 8 | 04-09-2023 to 09-09-2023 | Shell Model, Energy Level Diagram, Success and Failure of LDM, Nuclear Stability |
| Week 9 | 11-09-2023 to 16-09-2023 | Natural Radioactivity, Properties of alpha, beta and gamma rays, Difference between gamma and X rays |
| Week 10 | 18-09-2023 to 23-09-2023 | Fundamental laws and Rutherford law of decay, decay constant, half-life, average life, Activity, Units, Series, Branching |
| Week 11 | 25-09-2023 to 30-09-2023 | Laws of Successive disintegration, Radiation damage, velocity, range, Geiger Nuttal law, energetics, Nuclear potential, Gammow theory, Alpha spectra |
| Week 12 | 03-10-2023 to 07-10-2023 | Beta decay, neutrino postulate, Energy conditions, Inverse beta decay, Internal conversion |
| Week 13 | 09-10-2023 to 14-10-2023 | Types of nuclear rxns, Conservation laws, Kinematics, Physical significance of Q value, Nuclear cross-section |
| **Mid Semester Exam (16th October 2023 – 21st October, 2023)** | | |
| Week 15 | 25-10-2023 to 27-10-2023 | Compound Nucleus, Artificial radioactivity, radio isotopes, radio carbon dating, Geological dating |
| Week 16 | 31-10-2023 to 04-11-2023 | Rutherford scattering, impact parameter, Distance of closest approach, Coulomb scattering, |
| Week 17 | 06-11-2023 to 11-11-2023 | Neutron, energy classification, mass of neutron, Nuclear fission |
| Week 18 | 14-11-2023 to 18-11-2023 | Nuclear chain reaction, nuclear reactor, Reactor Facilities, Nuclear Fusion |

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**Teaching Plan Odd Semester (For UG-PG - Ongoing Classes)**

**Session (2023-2024)**

**Class: B.Sc 3th Semester Name of the Teacher: Dr. Harjeet Kaur**

**Subject: Optics Period : 5th**

**Paper : B Room No : 129**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 21-07-2023 to 22-07-2023 | On Ex-India Leave |
| Week 2 | 24-07-2023 to 28-07-2023 | On Ex-India Leave |
| Week 3 | 31-07-2023 to 05-08-2023 | Concept of coherence, spatial and temporal coherence, coherence time, coherence length, area of coherence. |
| Week 4 | 07-08-2023 to 12-08-2023 | Conditions for observing interference fringes, Interference by wavefront division and amplitude division. Young’s double Slit experiment. |
| Week 5 | 14-08-2023 to 19-08-2023 | Lloyd’s mirror and Fresnel’s biprism, Phase change on reflection |
| Week 6 | 21-08-2023 to 26-08-2023 | Newton’s rings, Michelson interferometer- working, principle and nature of fringes |
| Week 7 | 28-08-2023 to 02-09-2023 | Interference in thin films, Role of interference in anti-reflection. |
| Week 8 | 04-09-2023 to 09-09-2023 | Multiple beam interference. Fabry – Perot Interferometer, nature of fringes |
| Week 9 | 11-09-2023 to 16-09-2023 | Diffraction: Huygen - Fresnel theory of Diffraction. Fresnel’s half period zones, zone plates. Distinction between Fresnel and Fraunhofer diffraction. |
| Week 10 | 18-09-2023 to 23-09-2023 | Fraunhofer diffraction due to single slit and intensity distribution, double slits and multiple slits (qualitative). |
| Week 11 | 25-09-2023 to 30-09-2023 | Fraunhofer diffraction at rectangular (qualitative discussion) and circular apertures. |
| Week 12 | 03-10-2023 to 07-10-2023 | Resolving Power of a diffraction grating, its use as a spectroscopic element |
| Week 13 | 09-10-2023 to 14-10-2023 | resolving power of microscope and telescope, prism |
| **Mid Semester Exam (16th October 2023 – 21st October, 2023)** | | |
| Week 15 | 25-10-2023 to 27-10-2023 | Polarization: Concept and analytical treatment of unpolarized, plane polarized and elliptically polarized light. |
| Week 16 | 31-10-2023 to 04-11-2023 | Malus Law, Brewsters Law, Polarization by Reflection, Scattering |
| Week 17 | 06-11-2023 to 11-11-2023 | Dichorism, Double refraction, Nicol prism, Sheet polarizers, retardation plates. |
| Week 18 | 14-11-2023 to 18-11-2023 | Production and analysis of polarized light (quarter and half wave plates) |