Class- B.Sc 2   Teacher Name-Sunita Saini   Subject-Physics

Period No. 5   Name of Paper -Statistical physics and thermodynamics, Optics and lasers

Sr. No.	Date	Topics to be covered
1.	01/09/2021-20/09/2021	Basic ideas of statistical physics, Scope of statistical physics, Basic ideas about probability, distribution of four distinguishable particles in two compartment of equal size. Concept of macro states, microstates, thermodynamic probability, Effects of constraints on the system,
2.	21/09/2021-10/10/2021	Distribution of n particles in two compartments, Deviation from the state of maximum probability, equilibrium state of dynamic system, Distribution of distinguishable n particles in k compartments of unequal sizes.Phase space and its division into elementary cells,
3.	11/10/2021-30/10/2021	Three kinds of statistics. The basic approach in the three statistics, Maxwell Boltzman (MB) statistics applied to an ideal gas in equilibrium. Experimental verification of Maxwell Boltzman law of distribution of molecular speeds, Need for quantum statistics-Bose-Einstein (B.E.) statistics, Derivation of Planck's law of radiation
4.	01/11/2021-20/11/2021	Deduction of Wien's displacement law and Stefan's law from Planck's law, Fermi-Dirac (F.D.) statistics, Comparison of M.8., B.E. and F.D. stastics. Interference: Concept of coherence, Spatial and temporal coherence. **MST WILL BE HELD**
5.	21/11/2021-5/12/2021	Coherence time, Coherence length, Area of coherence, Conditions for observing interference fringes, Interference by wave front division and amplitude division, Michelson's interferometer-working, Principle and nature of fringes,
7.	28/01/2022-15/02/2022	Interference in thin films, Role of interference in anti-reflection and high reflection dielectric coatings. Multiple beam interference, Fabry-Perot interferometer, Nature of fringes, Newton Rings.
8.	16/02/2022-01/03/2022	Statistical definition of entropy, Change of entropy of a system, Additive nature of entropy, Law of increase of entropy, Reversible and irreversible process and their examples. Work done in a reversible process. Examples of increase of entorpy in natural processes, Entropy and disorder, Brief review of terms and laws of thermodynamics, Carnot's cycle, Entropy changes in Carnot cycle.
9.	02/03/2022-15/03/2022	Applications of thermodynamics to thermoelectric effect. Change of entropy along a reversible path in a P.V diagram, Entropy of a perfect gas, Equation of state of an ideal gas from simple statistical consideration, Heat death of the universe.Derivation of Maxwell's thermo dynamical relations, Cooling produced by adiabatic streching, Adiabatic compression, Change of internal energy with volume, specific heat at constant pressure and constant volume,
10.	16/03/2022-01/04/2022	Expression for C_p -C_v , Change of state and Clayperon equation, Thermo dynamical treatment of Joule-Thomson effect,

Class- B.Sc 2   Teacher Name-Sunita Saini   Subject-Physics

Period No. 5   Name of Paper -Statistical physics and thermodynamics, Optics and lasers

		Use of Joule-Thomson effect, liquefiction of helium, Production of very low temperature by adiabatic demagnetization.Laser Fundamentals : Derivation of Einstein's relations. Concept of stimulated emission and population inversion. Broadening of spectral lines, natural, collision and Doppler broadening. **MST WILL BE HELD**
11.	02/04/2022-25/04/2022	. Line width, Line profile, Absorption and amplification of a parallel beam of light passing through a medium. Threshold condition, Introduction of three level and four level laser schemes, elementary theory of optical cavity, Longitudinal and transverse modes.

Principal

Signature of teacher

Class- B.Sc. 1   Teacher Name - Sunita Saini   Subject-Physics

Period No. 1   Name of Paper -Mechanics, Electricity and Magnetism

Sr. No.	Date	Topics to be covered
1.	03/09/2021-20/09/2021	Cartesian and spherical polar co-ordinate systems, area, volume, displacement, velocity and acceleration in these systems, Solid angle, Various forces in Nature (brief introduction),
2.	21/09/2021-10/10/2021	Centre of mass, Equivalent one body problem, Central forces, Equation of motion under central force, Equation of orbit in inverse square, Force field and turning points, Kepler's laws and their derivations.
3.	11/10/2021-30/10/2021	Relationship of conservation laws and symmetries of space and time. Inertial frame of reference. Galilean transformation and invariance, Non-inertial frames of reference, Coriolis force and its applications
4.	01/11/2021-20/11/2021	Variation of acceleration due to gravity with latitude. Focault pendulum (qualitative). Elastic collision in Laboratory and C.M system, velocities, angles and energies, Cross section of elastic scattering . Rutherford scattering (qualitative). MST WILL BE HELD
5.	21/11/2021-10/12/2021	Work and potential difference. Potential difference as line integral of electric field. Electric potential due to a point charge, a group or point charges, dipole and quadruple moments, long uniformly charged wire, charged disc. Stoke's theorem and its application in Electrostatic field, curl E=O. Electric field as gradient of scalar potential.
6.	11/12/2021-24/12/2021	Calculation of E due to a point charge and dipole from potential. Potential due to arbitrary charge distribution and multipole moments. Poisson and Laplace's Equation and their solutions in Cartesian and concept of electrical images. Calculation of electric potential and field due to a point charge placed near an infinitely conducting sheet.
7.	15/03/2022-30/03/2022	Rigid body motion: Rotational motion, principal moments and axes. Euler's equations; precession and elementary gyroscope. Galilean transformation and Invariance, Non-Inertial frames, concept of stationary universal frame of reference and ether. Michelson-Morley experiment and its result. MST WILL BE HELD
8.	1/04/2022-15/04/2022	Postulates of special theory of relativity. Lorentz transformations, Observer and viewer in relativity. Relativity of simultaneity. Length, Time, Velocities, Relativistic Doppler effect. Variation of mass with velocity, mass-energy equivalence, rest mass in an inelastic collision, Relativistic momentum and energy, their transformation, concepts of Minkowski space, four vector formulation.
9.	16/04/2022-30/04/2022	Lorentz's force. Definition of B. Biot Savart's Law and its applications to long straight wire, circular current loop and solenoid. Ampere's Circuital law and its application. Divergence and curl of B. Hall effect expression and co-efficient. Vector potential, Definition and derivation of current density-definition its use in calculation or change in magnetic field at a current sheet.

Class- B.Sc. 1   Teacher Name - Sunita Saini   Subject-Physics

Period No. 1   Name of Paper -Mechanics, Electricity and Magnetism

		Transformation equation or E and B from one frame to another. Faraday's Law of EM induction. Displacement current . Maxwell's equations. Mutual inductance and reciprocity theorem. Self inductance L for solenoid. Coupling of Electrical circuits. Analysis of LCR series and parallel resonant circuits. Q—factor. Power consumed power factor.

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Teaching Plan
(Session 2021-22)

Class- B.Sc. 3   Teacher Name-Sunita Saini   Subject-Physics

Period No. 4   Name of Paper -Nuclear and Radiations Physics, Electronics

Sr. No.	Date	Topics to be covered
1.	01/09/2021-20/09/2021	Constituents of nucleus and their intrinsic properties, Qualitative facts about size, mass, density, energy, charge. Binding energy, angular momentum, magnetic moment and electric quadruple moments of the nucleus, Wave mechanical properties of nucleus, average binding energy and its variation with mass numbers, Properties of nuclear forces,
2.	21/09/2021-10/10/2021	Non existence of electrons in the nucleus and neutron-proton model, Liquid drop model and semi empirical mass formula, Conditions of nuclear stability, Fermi gas model. Nuclear shell model. Experimental evidence of magic numbers and its explanation.Radioactivity. Modes of decay and successive radioactivity. Alpha emission. Electron emission, Positron emission.
3.	11/10/2021-30/10/2021	Electron capture, Gamma-ray emission, Internal conversion, Qualitative discussion of alpha, beta and gamma spectra, Geiger-Nuttal rule, Neutrino hypothesis of beta decay. Evidence of existence of neutrino, Qualitative discussion of alpha and beta decay theories, Nuclear reactions. Reaction cross section, Conservation laws. Kinematics of nuclear reaction,
4.	01/11/2021-20/11/2021	Q-value and its physical significance, Compound nucleus, Possible reaction with high energy particles.Concept of current and voltage sources, p-n junction, Biasing of diode, V-A characteristics. Diode equation, Breakdown diodes: Zener breakdown and avalanche breakdown MST WILL BE HELD
5.	21/11/2021-5/12/2021	Zener diode. Rectification: half wave, full wave rectifiers and bridge rectifiers, Qualitative analysis of Filter circuits (RC LC and □ filters) Efficiency, Ripple factor, Voltage regulation. Voltage multiplier circuits.
7.	28/01/2022-15/02/2022	Energy loss due to ionization (Bethe's formula), Energy loss of electrons, Bremsstrahlung, Interactions of gamma rays with matter. Radiation loss by fast electrons, Radiation length, Electron-positron annihilation, Cyclotron. Betatron, Qualitative discussion of Synchrotron, Collider machines and linear accelerator.
8.	16/02/2022-01/03/2022	Ionization chamber, Proportional counter, GM counter, Scintillation counter, Solid state detectors, Elementary particles and their masses, Decay modes, Classification of these particles, types of interactions. Conservation laws and quantum numbers, Concepts of isospin.

9.	02/03/2022-15/03/2022	Strangeness, Parity, Charge conjugation. Antiparticles, Gell-Man method, Decay and strange particles. Particle symmetry, Introduction to quarks and qualitative discussion of the quark model. MST WILL BE HELD
10.	16/03/2022-01/04/2022	Gunn effect and diodes: Mechanism, Characteristic, Negative differential resistivity and Domain formation Tunnel diode: Tunneling Phenomenon, Operation, Applications. Merits and Drawbacks Transistor biasing: Stabilization of operating point, Fixed bias, Collector to base bias, Bias circuit with emitter resistor, Voltage divider biasing circuit.
11.	02/04/2022-25/04/2022	CE amplifier: Working and analysis using h-parameters, Equivalent circuits, Determination of current gain, Power gain, Input impedance, FET amplifier: Voltage, Current and Power gain Feed back in amplifiers: Types & advantage of negative feedback. Emitter follower as negative feed back circuit.

Principal

Signature of teacher