Summary of Lesson Plans of College Faculty

Name of Assistant Professor: Mrs.Rita Rani **Name of college:** CMG GCW Bhodia khera, Fatehabad

Academic session: 2018-19 **Class/Semester:**B.Sc. Ist Year (2nd Sem.) **Month: January,Feburary**

S. No.	Subject	Topics/ Chapters to be covered	Academic Activity to be organized	Assignment/ Tests to be given to the students
1	Physics	Paper 1:		
	Properties of Matter	Unit 1:Moment of inertia Rotation of rigid body, Moment of inertial, Torque, angular momentum, Kinetic Energy of rotation. Theorem of perpendicular and parallel axes (with proof), Moment of inertia of solid sphere, hollow sphere, spherical shell, solid cylinder, hollow cylinder and solid bar of rectangular cross–section, Fly wheel, Moment of inertia of an irregular body, Acceleration of a body rolling down on an inclined plane. Unit 2: Elasticity Elasticity, Stress and Strain, Hook's law, Elastic constant and their relations, Poisson's ratio, Torsion of cylinder and twisting couple, Determination of coefficient of modulus of rigidity for the material of wire by Maxwell's needle, Bending of beam (Bending moment and its magnitude), Cantilever and Centrally loaded beam, Determination of Young's modulus for the material of the beam and Elastic constants for the material of the wire by Searle's method.	Problems of the chapter were discussed	Test of the chapters were conducted
	Kinetic theory of gases-I	Unit 3: Assumption of Kinetic theory of gases, pressure of an ideal gas (with derivation), Kinetic interpretation of Temperature, Ideal Gas equation, Degree of freedom, Law of equipartition of energy and its application for specific heat of gases, Real gases, Vander wall's equation, Brownian motion(Qualitative)		
	Kinetic theory of gases-II	Unit 4: Maxwell's distribution of speed and velocities (derivation required), Experimental verification of Maxwell's law of speed distribution: most probable speed, average and r.m.s. speed, Mean free path, Transport of energy and momentum, Diffusion of gases.		

Month: March , April **Name of Assistant Professor:** Mrs.Rita Rani

Sr. No.	Subject	Topics/ Chapters to be covered	Academic Activity to be organized	Topic of Assignment / Tests to be given to the students
1	Physics	Paper 2		
	Semiconductor Devices	Unit I: Semiconductors Energy bands in solids, Intrinsic and extrinsic semiconductors, carrier mobility and electrical resistivity of semiconductors, Hall effect, p-n junction diode and their characteristics, Zener and Avalanche breakdown, Zener diode, Zener diode as a voltage regulator. Light emitting diodes (LED), Photoconduction in semiconductors, Photodiode, Solar Cell, p-n junction as a rectifier, half wave and full wave rectifiers (with derivation), filters (series inductor, shunt capacitance, L-section or choke, π and R.C. filter circuits). Unit 2: Transistors Junction transistors, Working of NPN and PNP transistors, Three configurations of transistor (C-B, C-E, C-C modes),Common base, common emitter and common collector characteristics of transistor, Constants of a transistor and their relation, Advantages and disadvantages of C-E configuration. D.C. load line .Transistor biasing; various methods of transistor biasing and stabilization. Unit 3: Transistor Amplifiers Amplifiers, Classification of amplifiers, common base and common emitter amplifiers, coupling of amplifiers, various methods of coupling, Resistance-Capacitance (RC) coupled amplifier (two stage, concept of band width, no derivation), Feedback in amplifiers, advantages of negative feedback, emitter follower, distortion in amplifiers. Unit 4: Oscillators Oscillators, Principle of oscillation, classification of oscillators, Condition for self sustained oscillation: Barkhausen criterion for oscillation, Tuned collector common emitter oscillator, Hartley oscillator, C.R.O. (Principle and Working)	Problems of the chapter were discussed	Test of the chapters were conducted

Summary of Lesson Plans of College Faculty

Name of Assistant Professor: Mrs.Rita Rani **Name of college:** CMG GCW Bhodia khera, Fatehabad

Academic session: 2018-19 **Class/Semester:**B.Sc. 2nd Year (4th Sem.) **Month: January to April**

Subject **Physics**	Topics/ Chapters to be covered	Academic Activity	Assignment/ Tests
Statistical Physics-1	Unit –I: Microscopic and Macroscopic systems, events-mutually exclusive, dependent and independent. Probability, statistical probability, A- priori Probability and relation between them, probability theorems, some probability considerations, combinations possessing maximum probability, combination possessing minimum probability, Tossing of 2,3 and any number of Coins, Permutations and combinations, distributions of N (for N= 2,3,4) distinguishable and indistinguishable particles in two boxes of equal size, Micro and Macro states, Thermodynamical probability, Constraints and Accessible states, Statistical fluctuations, general distribution of distinguishable particles in compartments of different sizes, Condition of equilibrium between two systems in thermal contact-- β parameter, Entropy and Probability (Boltzman's relation).	Problems of the chapter were discussed	Test of the chapters were conducted
Postulates of statistical physics,	Unit –II: Phase space, Division of Phase space into cells, three kinds of statistics, basic approach in three statistics. M. B. statistics applied to an ideal gas in equilibrium- energy distribution law (including evaluation of σ and β) , speed distribution law & velocity distribution law. Expression for average speed, r.m.s. speed, average velocity, r. m. s. velocity, most probable energy & mean energy for Maxwellian distribution.		
Quantum Statistics	Unit-III: Need for Quantum Statistics: Bose-Einstein energy distribution law, Application of B.E. statistics to Planck's radiation law B.E. gas, Degeneracy and B.E. Condensation, FermiDirac energy distribution law, F.D. gas and Degeneracy, Fermi energy and Fermi temperature, Fermi Dirac energy distribution law, Fermi Dirac gas and degeneracy, Fermi energy and Fermi temperature, Fermi Dirac energy distribution law for electron gas in metals, Zero point energy, Zero point pressure and average speed (at 0 K) of electron gas, Specific heat anomaly of metals and its solution. M.B. distribution as a limiting case of B.E. and F.D. distributions, Comparison of three statistics.		
Theory of Specific Heat of Solids	Unit-IV: Dulong and Petit law. Derivation of Dulong and Petit law from classical physics. Specific heat at low temperature, Einstein theory of specific heat, Criticism of Einstein theory, Debye model of specific heat of solids, success and shortcomings of Debye theory, comparison of Einstein and Debye theories.		

Summary of Lesson Plans of College Faculty

Name of Assistant Professor: Mrs.Rita Rani **Name of college:** CMG GCW Bhodia khera, Fatehabad

Academic session: 2019-20 **Class/Semester:**B.Sc. 1st Year (1st Sem.) **Month: August,sept.Oct.**

Subject **Physics**	Topics/ Chapters to be covered **Paper 1: : Classical Mechanics and Theory of Relativity**	Academic Activity	Assignment/ Tests
Classical Mechanics Theory of relativity Applications of theory of relativity	Unit 1: Basic concepts of Classical mechanics Mechanics of single and system of particles, Conversion law of linear momentum, Angular momentum and mechanical energy for a particle and a system of particles, Centre of Mass and equation of motion, Constrained Motion. Unit2: Generalized Notations Degrees of freedom and Generalized coordinates, Transformation equations, Generalized Displacement, Velocity, Acceleration, Momentum, Force and Potential, Hamilton's variational principle, Lagrange's equation of motion from Hamilton's principle, Linear Harmonic oscillator, Simple pendulum, Atwood's machine. Unit 3: Frame of reference, limitation of Newton's law of motion, Inertial frame of reference, Galilean transformation, Frame of reference with linear acceleration, Classical relativityGalilean invariance, Transformation equation for a frame of reference- inclined to an inertial frame and Rotating frame of reference, Non-inertial frames-The accelerated frame of reference and rotating frame of reference , Effect of centrifugal and coriolis forces due to Earth's rotation, Fundamental frame of reference, Michelson- Morley's experiment, concept of Einstein's relativity. Unit 4: Special theory of relativity, Lorentz co-ordinate and physical significance of Lorentz invariance, Length Contraction, Time Dilation, Twin Paradox, Velocity addition theorem, Variation of mass with velocity, Mass energy equivalence, Transformation of relativistic momentum and energy, relation between relativistic momentum and energy, Mass, velocity, momentum and energy of zero rest mass.	Problems of the chapter were discussed	Test of the chapters were conducted

Month: October, November

Subject **Physics**	Topics/ Chapters to be covered **Paper 2: Electricity, Magnetism and Electromagnetic theory**
Vector background and Electric field Magnetism Electromagnetism A. C. Analysis	Unit 1: 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, Gauss's divergence theorem, Stoke's theorem. Derivation of electric field E from potential as gradient, Derivation of Laplace and Poisson equations, Electric flux, Gauss's Law, Mechanical force of charged surface, Energy per unit volume. Unit 2: Magnetic induction, Magnetic flux, Solenoidal nature of vector field of induction, properties of (i) , (ii) , Electronic theory of dia and paramagnetism, Domain theory of ferromagnetism (Langevin's theory), Cycle of magnetization- hystresis loop (Energy dissipation, Hystresis loss and importance of Hystresis Curve) Unit 3: Maxwell equations and their derivations, Displacement current, Vector and Scalar potentials, Boundary conditions at interface between two different media, Propagation of electromagnetic wave (Basic idea, no derivation), Poynting vector and Poynting theorem. Unit 4: A.C. circuit analysis using complex variable with (a) Capacitance and Resistance (CR) (b) Resistance and Inductance (LR) (c) Capacitance and Inductance (LC) and (d) Capacitance, Inductance and Resistance (LCR), Series and parallel resonance circuit, Quality factor (sharpness of resonance).

Summary of Lesson Plans of College Faculty

Name of Assistant Professor: Mrs.Rita Rani **Name of college:** CMG GCW Bhodia khera, Fatehabad

Academic session: 2019-20 **Class/Semester:**B.Sc. 2nd Year (3rd Sem.) **Month: August to November**

Subject **Physics**	Topics/ Chapters to be covered **Paper 1:** Computer Programming and Thermodynamics	Academic Activity	Assignment/ Tests
Computer Programming Applications of FORTRAN programming Thermodynamics-I Thermodynamics-II	UNIT-1: Computer organization, Binary representation, Algorithm development, Flow charts and their interpretation. FORTRAN Preliminaries: Integer and floating point arithmetic expression, built in functions, executable and non-executable statements, input and output statements, Formats, IF, DO and GO TO statements, Dimension arrays, statement function and function subprogram. UNIT –2: Algorithm, Flow Chart and Programming for Print out of natural numbers, Range of the set of given numbers, Ascending and descending order, Mean and standard deviation, Least square fitting of curve, Roots of quadratic equation, Product of two matrices, Numerical integration (Trapezoidal rule and Simpson 1/3 rule) . UNIT-3: Thermodynamic system and Zeroth law of thermodynamics. First law of thermodynamics and its limitations, reversible and irreversible process. Second law of thermodynamics and its significance, Carnot theorem, Absolute scale of temperature, Absolute Zero and magnitude of each division on work scale and perfect gas scale, Joule's free expansion, , Joule Thomson effect, Joule-Thomson (Porous plug) experiment, conclusions and explanation, analytical treatment of Joule Thomson effect. Entropy, calculations of entropy of reversible and irreversible process , T-S diagram, entropy of a perfect gas, Nernst heat law(third law of thermodynamics), Liquefaction of gases, (oxygen, air, hydrogen and helium), Solidification of He below 4K, Cooling by adiabatic demagnetization. UNIT-4: Derivation of Clausius-Clapeyron and Clausius latent heat equation and their significance,specific heat of saturated vapours,phase diagrame and triple point of a substance, development of Maxwell thermodynamical relations. Thermodynamical functions: Internal energy (U), Helmholtz function (F), Enthalpy (H), Gibbs function (G) and the relations between them, derivation of Maxwell thermodynamical relations from thermodynamical functions,Application of Maxwell relations: relations between two specific heats of gas, Derivation of Clausius-Clapeyron and Clausius equation,variation of intrinsic energy with volume for (i) perfect gas (ii)Vanderwall gas (iii)solids and liquids , derivation of Stefans law, adiabatic compression and expention of gas & deduction of theory of Joule Thomson effect.	Problems of the chapter were discussed	Test of the chapters were conducted

Summary of Lesson Plans of College Faculty

Name of Assistant Professor: Mrs.Rita Rani **Name of college:** CMG GCW Bhodia khera, Fatehabad

Academic session: 2019-20 **Class/Semester:**B.Sc. Ist Year (2nd Sem.) **Month: January,Feburary**

S. No.	Subject	Topics/ Chapters to be covered	Academic Activity to be organized	Assignment/ Tests to be given to the students
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Month: March , April **Name of Assistant Professor:** Mrs.Rita Rani

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Academic session: 2019-20 **Class/Semester:**B.Sc. 2nd Year (4th Sem.) **Month: January to April**

Subject **Physics**	Topics/ Chapters to be covered	Academic Activity	Assignment/ Tests
Statistical Physics-1	Unit –I: Microscopic and Macroscopic systems, events-mutually exclusive, dependent and independent. Probability, statistical probability, A- priori Probability and relation between them, probability theorems, some probability considerations, combinations possessing maximum probability, combination possessing minimum probability, Tossing of 2,3 and any number of Coins, Permutations and combinations, distributions of N (for N= 2,3,4) distinguishable and indistinguishable particles in two boxes of equal size, Micro and Macro states, Thermodynamical probability, Constraints and Accessible states, Statistical fluctuations, general distribution of distinguishable particles in compartments of different sizes, Condition of equilibrium between two systems in thermal contact-- β parameter, Entropy and Probability (Boltzman's relation).	Problems of the chapter were discussed	Test of the chapters were conducted
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Name of Assistant Professor: Mrs.Rita Rani **Name of college:** CMG GCW Bhodia khera, Fatehabad

Academic session: 2019-20 **Class/Semester:**B.Sc. 1st Year (1st Sem)

Month: November to February

Subject **Physics**	Topics/ Chapters to be covered **Paper 2: Electricity, Magnetism and Electromagnetic theory**
Vector background and Electric field Magnetism Electromagnetism A. C. Analysis	Unit 1: 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, Gauss's divergence theorem, Stoke's theorem. Derivation of electric field E from potential as gradient, Derivation of Laplace and Poisson equations, Electric flux, Gauss's Law, Mechanical force of charged surface, Energy per unit volume. Unit 2: Magnetic induction, Magnetic flux, Solenoidal nature of vector field of induction, properties of (i) , (ii) , Electronic theory of dia and paramagnetism, Domain theory of ferromagnetism (Langevin's theory), Cycle of magnetization- hystresis loop (Energy dissipation, Hystresis loss and importance of Hystresis Curve) Unit 3: Maxwell equations and their derivations, Displacement current, Vector and Scalar potentials, Boundary conditions at interface between two different media, Propagation of electromagnetic wave (Basic idea, no derivation), Poynting vector and Poynting theorem. Unit 4: A.C. circuit analysis using complex variable with (a) Capacitance and Resistance (CR) (b) Resistance and Inductance (LR) (c) Capacitance and Inductance (LC) and (d) Capacitance, Inductance and Resistance (LCR), Series and parallel resonance circuit, Quality factor (sharpness of resonance).

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Academic session: 2020-21 **Class/Semester:**B.Sc. 2nd Year (3rd Sem.) **Month: August to october**

Subject **Physics**	Topics/ Chapters to be covered **Paper 1:** Computer Programming and Thermodynamics	Academic Activity	Assignment/ Tests
Computer Programming Applications of FORTRAN programming Thermodynamics-I Thermodynamics-II	UNIT-1: Computer organization, Binary representation, Algorithm development, Flow charts and their interpretation. FORTRAN Preliminaries: Integer and floating point arithmetic expression, built in functions, executable and non-executable statements, input and output statements, Formats, IF, DO and GO TO statements, Dimension arrays, statement function and function subprogram. UNIT –2: Algorithm, Flow Chart and Programming for Print out of natural numbers, Range of the set of given numbers, Ascending and descending order, Mean and standard deviation, Least square fitting of curve, Roots of quadratic equation, Product of two matrices, Numerical integration (Trapezoidal rule and Simpson 1/3 rule) . UNIT-3: Thermodynamic system and Zeroth law of thermodynamics. First law of thermodynamics and its limitations, reversible and irreversible process. Second law of thermodynamics and its significance, Carnot theorem, Absolute scale of temperature, Absolute Zero and magnitude of each division on work scale and perfect gas scale, Joule's free expansion, , Joule Thomson effect, Joule-Thomson (Porous plug) experiment, conclusions and explanation, analytical treatment of Joule Thomson effect. Entropy, calculations of entropy of reversible and irreversible process , T-S diagram, entropy of a perfect gas, Nernst heat law(third law of thermodynamics), Liquefaction of gases, (oxygen, air, hydrogen and helium), Solidification of He below 4K, Cooling by adiabatic demagnetization. UNIT-4: Derivation of Clausius-Clapeyron and Clausius latent heat equation and their significance,specific heat of saturated vapours,phase diagrame and triple point of a substance, development of Maxwell thermodynamical relations. Thermodynamical functions: Internal energy (U), Helmholtz function (F), Enthalpy (H), Gibbs function (G) and the relations between them, derivation of Maxwell thermodynamical relations from thermodynamical functions,Application of Maxwell relations: relations between two specific heats of gas, Derivation of Clausius-Clapeyron and Clausius equation,variation of intrinsic energy with volume for (i) perfect gas (ii)Vanderwall gas (iii)solids and liquids , derivation of Stefans law, adiabatic compression and expention of gas & deduction of theory of Joule Thomson effect.	Problems of the chapter were discussed	Test of the chapters were conducted

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