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Lecture Plan & Sequence_Warrior Course (W-2 Batch)

Chapter Name	Lecture No.	Topic
Periodic Table	1	General Introduction and history of Periodic Table
	2	Group Number, Period Number and Basic Inorganic, Nomenclature
	3	Effective Nuclear Charge (Z effective)
	4	Atomic & Ionic Radius
	5	Ionization Energies
	6	Electron Gain Enthalpies
	7	Electro negativity
	8	Diagonal Relationship and Periodic Characteristics
Chemical Bonding	1	Types of bonding (Definitions of Ionic bond Covalent bond and Metallic bond)
	2	Octet rule, Limitations of octet rule, Formal charge
	3	Writing the lewis dot structure
	4	Structure Drawing
	5	Writing resonating structures, finding average bond order
	6	VBT, overlapping of orbital
	7	VSEPR Theory
	8	Theory of Hybridization
	9	Hybridization calculation
	10	Bond Parameters-1 (Bond Angle)
	11	Bond Parameters-2 (Bond Order and Bond Length)
	12	Type of p bonding (pp-pp & pp-dp bond) & Coordinate bonding.
	13	Molecular Orbital Theory
	14	Application of Molecular Orbital Theory
	15	Metallic Bonding, Fajan Rule
	16	Van der Waal's Forces (Dipole)
	17	Van der Waal's Forces (Hydrogen Bonding)
	18	Dipole moment
	19	Electron deficient bonding & Back bonding
	20	Bridge bonding
Coordination Compound	1	General introduction of complex salts & Different terms/definitions to be used in coordination compound
	2	Introduction to Ligands and Denticity
	3	Chelation, Flexidentate Ligand and Ambidentate Ligand
	4	Nomenclature of Coordination Compounds
	5	Nomenclature of Coordination Compounds (Naming of pi-bonded complex & Naming of bridging complex)
	6	Werner's Theory & EAN Rule
	7	Synergic Bonding
	8	Valence bond theory
	9	Spectro Chemical Series and Crystal field theory for octa-hedral Complex
	10	Crystal field theory for square planar & Tetrahedral Complex
	11	Factor Affecting Splitting Energy
	12	Some Properties of Coordination Compounds and their Application
	13	Organometallic Compounds
	14	Structural isomerism
	15	Geometrical Isomerism.
	16	Optical Isomerism-1
	17	Optical Isomerism-2

S-Block Element	**1**	Introduction and General trends of Alkali Metals
	2	Flame test + Hydration enthalpy + Reducing strength and Chemical Reactions
	3	Different Oxides of Alkali Metals and Solubility in liquid NH_3
	4	Important compounds of S-block (NaOH and its reactions)
	5	Introduction and General Trends of Alkaline Earth Metals
	6	Important compounds of S-block (Washing Soda, Bleaching Powder, Gypsum, Plaster of Paris etc.)
	7	Solubility in water + Thermal Decomposition of Carbonates, Sulphate, Hydroxide of S-Block Elements
P-Block Element (13 & 14 Group)7	**1**	Introduction to Boron Family & General Trends
	2	Occurrence, Preparation & Chemical Reactions of Boron
	3	Important compounds of Boron
	4	Important Compounds of Aluminium
	5	Introduction to C family & general trends
	6	Allotropes of Carbon (Diamond, Graphite, Fullerene)
	7	General Reactions of Important compounds of Carbon Family
	8	Silicates and Silicones
P-Block Element (15 & 18 Group)	**1**	Nitrogen family and Chemical and physical properties
	2	Synthesis and Reactions of N_2, NH_3, Oxide of Nitrogen, HNO_3
	3	Different Phosphorous Allotropic forms and Reaction of PH_3, PCl_3, PCl_5
	4	Naming of Different Oxyacids of Phosphorus and their Structure , P_4O_6, P_4O_{10}
	5	Oxygen family Chemical and physical properties
	6	Preparation and Reactions of O_2, O_3, H_2O_2, H_2SO_4
	7	Naming and Structure of Oxyacids of Sulphur and Important Compounds (Sulphur, H_2S, SO_3)
	8	Halogen family chemical and Physical properties
	9	Preparation and Chemical Reactions of Bleaching powder, Pseudo halogen & Interhalogen compound
	10	Noble gases and Different Compounds of xenon
D & F - Block Element	**1**	d-Block – General Properties
	2	Oxidation State, Electrode Potential Colour, Magnetic Properties and Photography
	3	Chemical Properties and General Reactions of $KMnO_4$ & $K_2Cr_2O_7$
	4	f-Block – General Properties and reactions
Metallurgy	**1**	Introduction of Ores and Their Naming
	2	Separation Technique
	3	Calcination, Roasting and Smelting
	4	Ellingham diagram, Extraction of Fe
	5	Extraction of Cu, Pb, Sn, Zn, Ag & Au.
	6	Purification
Types of Reactions	**1**	Redox Reactions Part-1
	2	Redox Reactions Part-2
	3	Redox Reactions Part-3
	4	Thermal decomposition reactions
	5	Disproportionation reactions
	6	Comproportionation reactions
	7	Special Reactions Part-1
	8	Special Reactions Part-2
Salt Analysis	**1**	Cationic Analysis Part-1
	2	Cationic Analysis Part-2
	3	Cationic Analysis Part-3
	4	Cationic Analysis Part-4
	5	Anionic Analysis Part-1
	6	Anionic Analysis Part-2
	7	Anionic Analysis Part-3

	8	Anionic Analysis Part-4
PHYSICAL CHEMISTRY		
Chapter Name	**Lecture No.**	**Topic**
Mole Concept	1	Electron, Proton, Neutron Calculation
	2	Basic Terms: Atomic Mass, Molecular Mass, Gram Atomic Mass, Relative Atomic Mass
	3	Mole Calculation based on no of particles, Mass, Volume
	4	Problem solving on mole calculation
	5	Application of percentage composition, Relative density, Vapour density, Specific gravity
	6	Molecular formula calculation
	7	Empirical formula calculation
	8	Stoichiometry and Limiting Reagent
	9	Limiting Reagent application
	10	Mixed problems
	11	POAC and It's applications
	12	Concentration terms, % W/W, % W/V, %V/V & It's applications
	13	Molarity, Molality and It's applications
	14	Dilution, Mixing and Neutrallisation reactions
	15	Volume Strength and Oleum labelling
Atomic Structure	1	Discovery of e^-, P, n, Millikan oil drop experiment
	2	Earlier model of an atom, Rutherford model
	3	Isotopes, Isobars, Isotones, Isodiapher, P.E. distance of closest approach
	4	Maxwell theory of EMR, Black body radiation
	5	Planck's quantum theory, Photoelectric effect
	6	Bohr model of an atom
	7	Application of Bohr model
	8	Hydrogen Spectrum and its application
	9	Hydrogen Spectrum application
	10	De-Broglie wavelength and Heisenberg Uncertainity Principle
	11	Quantum Numbers
	12	Radial Nodes and Angular Nodes
	13	Application of quantum numbers, Aufbau rule, Hund's rule, Pauli exclusion principle
	14	Electronic configuration and its application
	15	Schrodinger Wave Mechanical Model
	16	Radial wave function, Probability density R.P.D.F
Redox Reaction	1	Concept of oxidation, Reduction and Oxidation Number
	2	Calculation of oxidation Number
	3	Balancing of redox reaction ion electron method
	4	Oxidation Number method
	5	Equivalent Concept and n_f calculation
	6	n_f calculation part-2
	7	Titration and its application
	8	Problem solving on titration
	9	Iodi and Iodometric titration, back and double titration
	10	Hardness of water
Chemical Kinetics	1	Rate of Reactions
	2	Average rate and instantaneous rate
	3	Rate Law, Order and Molecularity
	4	Zero order reaction
	5	1^{st} order reaction
	6	2^{nd} and n^{th} order reaction
	7	Experimental Method to calculate order

	8	Monitoring the progress of reaction
	9	Sequential, parallel & reversible reaction
	10	Sequential, parallel & reversible reaction
	11	Arrhenius equation and Intermediate theory
	12	Order Calculation from Mechanism of Reaction
Liquid Solution	**1**	Concentration terms
	2	Vapour pressure
	3	Immiscible liquid & Henry law
	4	Raoult's Law & Dalton's Law of Partial Pressure
	5	Application of Raoult's and Dalton's Law
	6	Ideal & Non-ideal Solutions
	7	Azeotropes & Phase diagram
	8	Colligative Properties & RLVP
	9	DT_b & DT_f
	10	Abnormal Mass and Vant Hoff Equation
	11	Osmotic Pressure and Its Application
Chemical Equilibrium	**1**	Types of reaction on the basis of direction and their properties, Definition of chemical equilibrium and its properties.
	2	Types of equilibrium, Law of mass action, Equilibrium Constant, Types of Equilibrium constant K_p, K_c and
	3	Equilibrium constant for various reactions, Properties of Equilibrium constant
	4	Numerical Approach using mole method
	5	Numerical approach using degree of dissociation method
	6	Mixed Problem Solving
	7	Calculation of degree of dissociation using vapour density method
	8	Reaction quotient, Thermodynamics of equilibrium
	9	Le'chatelier principle and Its Application
	10	Le'chatelier principle and Its Application
	11	Physical Equilibrium
Ionic Equilibrium	**1**	Introduction & Arrhenius theory of electrolytic dissociation
	2	Ostwald dilution law & properties of water
	3	Concept of Acids and bases, Levelling Solvent, Common ion effect.
	4	PH calculation of different types of solutions strong acid & strong basic solution, Mixture of strong acid & strong base.
	5	PH of weak acids, mixture of weak acids & Relative strength of Acids & base.
	6	Salts & types of salt
	7	Hydrolysis of salt part-I
	8	Hydrolysis of salt part-II
	9	Problem Solving on Salt Hydrolysis
	10	Buffer solution, Acidic Buffer, Basic Buffers
	11	Buffer capacity
	12	Solubility and solubility product (k_{sp})
	13	Application of Solubility Product
	14	Indicators
	15	Titration Curve
Gaseous State	**1**	Introduction and Parameters used to define a gas
	2	Barometer and Manometer
	3	Gas Laws
	4	Application of Gas Laws and Ideal gas Equation
	5	Problems related to container
	6	Kinetic Theory of Gases and Its Application
	7	Maxwell and Boltzmann distribution curve
	8	Graham's law, Diffusion/Effusion

	9	Real Gas, Derivation of Wander Waal Equation
	10	Compressibility factor and its application
	11	Andrew's Isotherm
Thermodynamics	**1**	Fundamental of thermodynamics system, Surrounding, Boundary, Types of System, State Variables Extensive and intensive properties
	2	Types of thermodynamics process.
	3	Reversible and Irreversible Process, State and Path functions
	4	Work heat, Their sign conventions, Internal energy, First law of thermodynamics
	5	Heat capacity and Enthalpy
	6	Problem solving on internal energy and enthalpy, Kirchoff law and its application
	7	Work in isochoric, Isobaric, reactions taking place at constant P and T, Isothermal process
	8	Comparison between rev. and irr. Isothermal process, Adiabatic process, Comparison between rev, and irr. Adiabatic process
	9	Comparison between rev. isothermal and rev. adiabatic, Problem solving on isothermal and adiabatic process
	10	Polytrophic process, Cyclic process and their application
	11	Second law of thermodynamics, Entropy Carnot cycle
	12	Clausivs inequalities, Entropy y calculation for system in case of general substance and ideal gas
	13	Entropy calculation in isothermal and Adiabatic ideal gas process, Entropy in physical process and chemical reactions.
	14	Problems solving on entropy in various process
	15	Third law of thermodynamics Gibbs energy, Condition for spontaneity.
	16	Physical significance of G, Variation of G with P and T
	17	Gibbs free energy and equilibrium constant
Thermochemistry	**1**	Enthalpy of Substance, Enthalpy of Reactions Thermochemical Equation, Enthalpy of Formation and Heat of Reactions from Heat of Formations.
	2	Hess Law, Enthalpy of Combustion & Measurement of Heat of Reactions From Enthalpy of Combustion
	3	Kirchoff's Equations, Heat of Solution, heat of Hydration, Heat of Atomisation, Resonance Energy
	4	Enthalpy of Neutralisation, Enthalpy of Phase Transformation
	5	Bond Enthalpy & Measurement of Heat of Reactions From Bond Enthalpy
Electrochemistry	**1**	Introduction and Electro chemical cell
	2	Electrode Potential, Standard Electrode Potential, Standard Hydrogen electrode, Electro chemical Series
	3	Standard Hydrogen electrode, Electro chemical Series, Calculating SRP of an electrode from the given SRP of other electrode
	4	Cell representation, Nernst equation & Type of electrode
	5	Metal-Metal Insoluble salt electrode
	6	Concentration cell
	7	Thermodynamic function of cell reaction
	8	Electrolytic cell & Farady's law of electrolysis
	9	Product of Electrolysis
	10	Electrolytic conductance & Variation of conductivity with dilution
	11	Kohlrausch Law and Application of Kholrausch law
	12	Condunctometric Titration
	13	Cell's lead storage batteries & fuel cell
Solid State	**1**	Crystalline& amorphous solids
	2	Structure of crystalline solid & Seven primitive unit cell
	3	Number of atoms per unit cell and density of unit cell
	4	Simple Cubic, BCC & FCC Arrangement
	5	Arrangement in 2-D & 3-D & HCP Packing
	6	Void in close packing
	7	Structure of Ionic compound
	8	Crystal defects

	9	Electrical Properties & Magnetic Properties.
Surface Chemistry	1	Adsorption, Types of Adsorption
	2	Freundich Isotherm, Langmuir Isotherm
	3	Colloids, Classification of Colloids
	4	Preparation of Colloids
	5	Purification of Colloids
	6	Properties of Colloids, Exclusions
	7	Catalysis

ORGANIC CHEMISTRY

Chapter Name	Lecture No.	Topic
IUPAC	1	Intro Organic Chemistry
	2	Bond Line Notation
	3	Degree & DBE
	4	Naming of Alkane
	5	Naming of Alkene, alkyne & cyclic
	6	Functional Group Nomenclature
	7	Polyfunctional Compounds
	8	Aromatic Compounds
	9	Problem Solving (Main)
GOC	1	Inductive Effect
	2	Intermediates in Organic
	3	Stability of Intermediates
	4	Resonance
	5	How to Draw Resonance Structures
	6	Comparing Stability of Resonating Structures
	7	Aromaticity
	8	Resonance Energy
	9	Hyper Conjugation
	10	Application of RHI
	11	Acidic Strength
	12	Basic Strength
	13	Problem Solving (Main)
Isomerism	1	Structural Isomerism
	2	Calculation of Structural Isomerism
	3	Tautomerism
	4	Sawhorse, Newman Projection
	5	Fischer Projection
	6	Conformational Isomerism
	7	Application of Conformational Isomerism
	8	Conformation of Cyclohexane
	9	Geometrical Isomerism
	10	Geometrical Isomerism Calculation
	11	Chiral Center and Polarimeter
	12	R, S Configuration and POS
	13	Optical Activity and Symmetry
	14	Enantiomer & Diastereomer
	15	Calculation of Stereoisomers
	16	Problem Solving (Main)
Basics of Organic Chemistry Mechanisms	1	Electrophile & Nucleophile
	2	Solvent, Leaving Group and Nucleophilicity
	1	Reaction of Alkanes

Hydrocarbon	**2**	Photohalogenation
	3	Use of NBS
	4	Markovnikov Addition of Alkenes
	5	Rearrangement of Carbocation
	6	Ring Expansion, KCP and TCP
	7	Peroxide Effect
	8	Syn Addition Reaction
	9	Bromine Addition, Halo Hydrin Formations
	10	Acid Catalyzed hydration of Alkene
	11	Oxymercuration and Demercuration
	12	Hydroboration Oxidation
	13	Kucherov Reaction
	14	Ozonolysis
	15	Epoxidation
	16	Use of hot $KMnO_4$
	17	Problem Solving (Main)
Haloalkanes, Haloarnes, Alcohol and Ether	**1**	Introduction Substitution & Elimination
	2	S_N2 reaction
	3	Williamson Ether Synthesis
	4	Finkelstein & Swartz reaction
	5	S_N1 reaction
	6	S_N1 vs S_N2
	7	Reaction of PCl_5 and $SOCl_2$
	8	Hydrolysis of Ether
	9	Reaction of Alcohol with HX
	10	Advanced (Hydrolysis of Ether)
	11	S_N Ar
	12	Dehydration of Alcohol
	13	SN NGP
	14	E_2 Reaction
	15	Hofmann Elimination
	16	E_1cb
	17	Substitution vs Elimination
	18	E_2 reaction (Advanced)
	19	Problem Solving (Main)
Grignard Reagent	**1**	Introduction
	2	Nucleophilic Addition of Aldehyde & Ketone
	3	Reaction of G.R with Aldehyde & Ketone
	4	Reaction with Acid Derivatives
	5	Problem Solving (Main)
Oxidation Reduction	**1**	Oxidizing Agents
	2	Reducing Agent
	3	Problem Solving (Main)
Aldehyde and Ketone	**1**	Aldehyde & Ketones Part-I
	2	Heating Effect
	3	Protection of Functional gp
	4	Reaction with Ammonia Derivative
	5	Wolf Kishner & Clemenson Reduction
	6	Aldol Reaction
	7	Intramolecular Aldol
	8	Cannizzaro Reaction

	9	Haloform Reaction
	10	Esterification + Acylation
	11	HVZ Reaction
	12	Problem Solving (Main)
Carbenes	**1**	Carbene and its stability
	2	Carbyl Amine
	3	Reimer Tiemann
	4	Hoffman Broamide Reaction
	5	Problem Solving (Main)
Aromatic Chemistry	**1**	Activating & Deactivating
	2	Directive Influence of groups
	3	Friedel Craft Alkylation
	4	Friedel Craft Acylation
	5	Nitration
	6	Organic Conversion-Basics
	7	Oxidation and Reduction in Aromatic Compound
	8	Sulphonation & Halogenation
	9	Benzene Formation
	10	Diazonium Salt & Reaction
	11	Coupling Reaction & Azodye Formation
	12	Problem Solving (Main)
Biomolecules	**1**	Introduction to Carbohydrates, Glucose and Haworth Projection
	2	Fructose & Mutarotation
	3	Sucrose & Inversion of Sugar
	4	Maltose, Lactose and Epimers
	5	Polysaccharides
	6	Reducing and Non-Reducing Sugar
	7	Introduction the Amino Acid
	8	Zwitter Ion & Peptide Formation
	9	Structure of Proteins and Denaturation
	10	Introduction to Nucleic Acid
	11	DNA and RNA
	12	Problem Solving (Main)
Polymer	**1**	Introduction to Polymer
	2	Addition Polymer and Its Application
	3	Addition Polymers-2
	4	Condensation Polymer
	5	Problem Solving (Main)
POC	**1**	Quantitative Analysis
	2	Quantitative Analysis-2
	3	POC-1 (Test for Functional gp)
	4	POC-2 (Test for Functional gp)
	5	POC-3 (Test for Functional gp)
	6	POC-4 (Test for Functional gp)
	7	POC-5 (Lassaigne's Extract)
	8	POC-6 (Crystallization + Sublimation)
	9	POC-7 (Distillation and Differential Extraction)
	10	POC-8 (Chromatography)
	11	Problem Solving (Main)
	1	Drug Target Interaction
	2	Antacids and Antihistamine

Chemistry in Everyday Life	**3**	Tranquilizers and Analgesics
	4	Antimicrobial and Anti Fertility Drugs
	5	Chemicals in Food Industry
	6	Soap and Detergent
	7	Problem Solving (Main)

MATHEMATICS

Chapter Name	Lecture No.	Topic
Quadratic Equation	**1**	identity & Ration between roots of cofficient
	2	formation of equation, nature of roots, common roots
	3	Range & graph of quadratic expression
	4	location of roots & analysis of polynomial
	5	NTA Abhyas
	6	Problem Solving
Compound Angle	**1**	Trigonometric Ratio
	2	Trigonometric Identities
	3	Reduction of Angle F
	4	Graph of Trigonometric Functions F
	5	Range of Trigonometric function & TRigonometry of Compound angle
	6	Transformation Formulae
	7	Sum of sine & Cosine Series
	8	Problem Solving
	9	Conditional Identities
	10	Sum of Trigonometric Series
	11	Problem Solving
Set theory	**1**	Types of set, algebra of sets
	2	Venn digaram
Relation	**1**	Relation
Function	**1**	Function & Domain of Function
	2	Modulas function
	3	Greatest integer function ,fraction part function
	4	Signum function,exponential function,logarithmic function 26092020
	5	Transformation of Graph 29092020
	6	Classification & number of function
	7	Composite function , Composition of iece-wise Defined function
	8	Odd & Even Function, Periodic Function
	9	Inverse of Function,Range of Function
	10	Function Equation
	11	NTA Abhyas
	12	Problem Solving
	13	Problem Solving
	14	Problem Solving
	15	Problem Solving
ITF	**1**	Graph of Basic ITF
	2	ITF Problem Solving
	3	Properties of ITF
	4	Properties of ITF
	5	summation and difference identities
	6	Summation of inverse trigonometric series
	7	
	1	Basics of Limit
	2	Indeterminant form of limits

Limits	**3**	Evaluation of limit
	4	Evaluation of infinite type limits
	5	Limits Using Expansion, Trigonometric Limits
	6	Exponantial, Logarithmic limit and 1 raise to power infinite
	7	raise to power infinite type and L'hospital rule
	8	Sandwich Theorem, NTA Abhyas
	9	Problem Solving
Continuity & Differentiability	**1**	Continuity at a Point & Ininterval
	2	Continuty of Composit Function
	3	Types of Discontinuty & IMVT Theorem
	4	Basic & Geometric Interpretation of Differentiability
	5	Differentiability in an Interval & Diff. Using Graph
	6	Differentiability Using Differentiation & Functional Equ.
	7	Problem Solving
	8	Problem Solving
MOD	**1**	Method of Differentiattion
	2	Rules of differentiation
	3	Chain rule & Logarithmic differentiattion
	4	Perametric Differentiattion & Diff. of Implicit Fun.
	5	Derivative of Inverse function
	6	Successive Differentation
	7	NTA abhyas
	8	Problem Solving
AOD	**1**	Tangent & Normal
	2	Angle Bw Two Curves **AND** Shortest Distance Bw Two Curves
	3	Rate measurement & Approximation **AND** Length of Tangent , Normal, Subtangent, Subnormal
	4	Monotonocity **AND** monotonocityin a Interval & Gratest Value of Function
	5	Establishing Inequality
	6	Concavity & Point of inflection
	7	Isolation of Roots **AND** Local Maxima & Minima
	8	Problem Solving & Nth Deravative test
	9	Global Maxima & Minima Curve tracing
	10	Curve tracing
	11	LMVT & Rolle's Theorem
	12	Application Maxima & Minima **AND** NTA Abhyas
	13	Problem Solving
Matrix and Determinant	**1**	Determinant
	2	Problem solving & Summation of Determinant
	3	Product of two determinat
	4	Differetiation and intigration of determinant
	5	System of linear equations(Cramer's Rule)
	6	Matrix, Tpyes of matrices & Operation on Matrices
	7	Product of matrix , trace ,tranpose of matrix, symmetric, skew symmetric matrix
	8	Orthogonal matrix and adjoint of matrix
	9	Adjoint and inverse of matrix
	10	Matrix polynomail ,characterstic equation system of equation AND NTA Abhyas
	11	Problem Solving
	12	Problem Solving
	1	Basics, Integration
	2	Technique of Integration
	3	Integration by substitution

Indefinite Integration	**4**	Integration by parts
	5	Integration by partial fraction
	6	Miscellaneous,integration
	7	Integrals of trigonometric functions
	8	Some special integals
	9	Problem Solving
	10	Problem Solving
Definite Integration	**1**	Basic Definite Integration
	2	Definite integration by Parts
	3	Properties of Definite Integrations
	4	King rule of Definite integration 21092020
	5	King rule part 2 AND Queenrule, definite integration
	6	Jack, definite integration AND leibnitg rule definite integration
	7	Iintegration as a limit of sum definite integration AND Reduction formulae and inequalities in definite integration
	8	Problem Solving
	9	Problem Solving
Area Under Curve	**1**	Basic Of Area Under The Curve AND Some Standard Areas
	2	Shifting Of Origin AND Curve Tracing AND Area Under Image Of Function
	3	Variable Area Concept NTA Abhyas
	4	Problem Solving
Differential Equation	**1**	Order Degree And Formation Of Differential Equation & Variable Seperable
	2	Polar Coordinates AND Equation Homogeneous
	3	Linear Differential Equation AND Bernouills Equation
Vector	**1**	Basics of Vector
	2	Collinearity and Coplanerity of vectors
	3	Dot Product , (Scalar Product)
	4	Vector Product,(Cross Product)
	5	Scalar triple Product (Box Product)
	6	Volume of tetrahedron **AND** Vector Tripple Product & NTA Abhyas
	7	Problem Solving
	8	Problem Solving
3D	**1**	Basic Of 3D **AND** Direction cosine & Direction ratio
	2	Equation of Line **AND** Angle between two lines AND Perpendicular distance of a point from a line and image of a point
	3	Analysis of two lines) **AND** Skew Lines
	4	Equation of plane **AND** Plane & Point
	5	Plane & Plane AND Plane & Line
	6	NTA Abhyas
	7	Problem Solving
	8	Problem Solving
Sequence & Series	**1**	Basic & General Term Of A.P
	2	Sum of n Terms of A.P
	3	Arithmatic Mean AND General Term of
	4	Sum of G.P
	5	Problem Solving & Sum of Infinite
	6	Geometric Mean AND Harmonic Progration & Relation Bw AM, GM, HM
	7	Problem Solving (AM GM) **AND** Arithematic Geometric Prograssion
	8	Summation by Sigma operator & method of Difference **AND** Sum of Special Series (Problem Solving)
	9	NTA Abhyas
	10	Problem Solving
	11	Problem Solving

	12	Problem Solving
Binomial Theorem	**1**	General Term of a Binomial Expression
	2	Genral term middle term numerically Greatst term
	3	Sum of binomial Cofficiance
	4	Sum of Binomial Series & Multinomial Theorem **AND** Analysis of Integral & Fraction Part of Binomial Expression
	5	Binomial theorem for any index **AND** Application of Binomial Theorem
	6	NTA Abhyas
	7	Problem Solving
	8	Problem Solving
Permutation & Combination	**1**	Fundamental Principle of Counting
	2	Factorial & Exponent of Primr Number
	3	Permutation
	4	Permutation & Rank of Word
	5	Combination **AND** Problem Solving
	6	Geometric Application of nCr
	7	Permutation of alike Objects & Number of Divisors
	8	Division & Distribution
	9	Distribution of alike Objects **AND** Station problem
	10	Circular permutattion
	11	Principal of inclusion and exclusion
	12	Derangement and summation of number
	13	NTA Abhyas
	14	Problem Solving
Probability	**1**	Basic of probability
	2	Problem Solving **AND** Problem Solving Based upon Permutation & Combination
	3	Addition Theorem of Probability **AND** Conditional Probability & Multiplication Theorem
	4	Total Probability Theorem **AND** bayes theorem
	5	Probability Distribution **AND** Tree Diagram
	6	Binomial Distribution **AND** NTA Abhyas
	7	Problem Solving
	8	Problem Solving
Straight Line	**1**	Locus & its Equations **AND** Area of triangle **AND** Slope and angle Bw Line
	2	Equation of line **AND** Symmetric Form or Parametric form
	3	Transformation of Axes **AND** Position of 2 Points
	4	Perpendicular Distance,Foot of perpendicular,Image of a point **AND** Image of a vertex w.r.t. angle bisector **AND** Distance Bw parallel lines& Area of parallelogram
	5	Centroid & Orthocenter **AND** Incenter, Circumcenter **AND** Problem Solving
	6	Angle Bisector **AND** Problem solving(Angle Bisector) **AND** Reflection & Refraction of lines
	7	Family of Lines **AND** Pair of Straight Line **AND** Separation of lines
	8	Equation of angle Bisector of PSL &distance bw parallel lines **AND** Homogination
	9	NTA Abhyas
	10	Problem Solving
	11	Problem Solving
Circle	**1**	Basics of circle **AND** equation of circle
	2	Position of a point, length of intrecept **AND** Tangent of circle
	3	Pair of tangent , chord of contact **AND** direct circle, power of
	4	Analysis of circle **AND** problem solving
	5	Common chord of two circles **AND** angle of intersection of two circle
	6	Family of circles **AND** radical axis & radical centre
	7	NTA abhyas
	8	Problem Solving

Parabola	**1**	Basics Of Conic Section **AND** Parabola
	2	Focal Chord **AND** Problem Solving
	3	Tangent Of Parabola **AND** Properties Of Tangents
	4	Problem solving **AND** Normal To Parabola
	5	Co-Normal Points **AND** Problem Solving(Normal & Co-Normal Points)
	6	Pair Of Tangent,Chord Of Contact,Diameter NTA Abhyas
	7	Problem Solving
	8	Problem Solving
	9	Problem Solving
Ellipse	**1**	Basic of Ellipse & Problem Solving
	2	Auxiliary Circle, Eccentric Angle, Focal Chord & Problem Solving
	3	Tangent of Ellipse
	4	Properties Of Tangent, Chord of Contact,chord when mid pt is given
	5	Pair of tangent,Director Circle, Normal to Ellipse
	6	Diameter & Properties Of Diameter
	7	Equation of an Ellipse Preffered to two Perpendicular Lines,
	8	
Hyperbola	**1**	Basic Of Hyperbola **AND** Auxiliary Circle, Eccentric Angle, Focal Distance **AND** Problem solving
	2	Conjugate Hyperbola **AND** Asymptotes Of Hyperbol
	3	Tangent Of Hyperbola **AND** Chord Of Contact,Director Circle
	4	Normal To Hyperbola **AND** Diameter & Standard Property Of Hyperbola
	5	Reflection Property Of Hyperbola **AND** Rectangular Hyperbola
	6	Problem Solving
	7	Problem Solving
Complex Number	**1**	Basics ofComplex Number, Algebra of complex number
	2	Conjugate of Conplex Number & Problem Solving
	3	Modulus of Complex Number & Triangular Inequality
	4	Argument of Complex Number, Polar form & Rotation of a complex number
	5	Problem Solving(argument & polar form of complex number, Square root of complex number
	6	Cube Roots of Unity & Problem Solving of Cube Roots
	7	Nth Roots of Unity
	8	Geometry of complex number & Straight Line & Circle
	9	Problem Solving of Geometry
SOT	**1**	Sine & Cosine Rule
	2	Tangent Rule , Projection Rule & Area Of Triangle
	3	Circumecircle **AND** Incircle
	4	Orthocentre & Pedal Triangle **AND** Centroid & Length Of Median
	5	Half Angle Formulas AND M-N Theorem
	6	Escribed Circle **AND** Regular Polygon
	7	Problem Solving
	8	Problem Solving
	9	Problem Solving
Trigonometric Equation	**1**	Lecture-1
	2	Lecture-2
		Lecture-3
Statistics	**1**	Lecture-1
	2	Lecture-2
	3	Lecture-3
Reasoning	**1**	Lecture-1
	2	Lecture-2
	3	Lecture-3

Height & distance	1	Lecture-1
PHYSICS		
Chapter Name	**Lecture No.**	**Topic**
Mathematical Tools	1	Function
	2	Trigonometry
	3	Slope
	4	Curve
	5	Differentiation
	6	Rules of differentiation
	7	Differentiation
	8	Rules of differentiation
	9	Chain Rule
	10	Maxima & minima application of differentiation
	11	Indefinite integration.
	12	Definite Integration, Area under the curve
	13	Define vector, Vector addition, Resolution of vector
	14	Multiplication of vector (Dot product)
	15	Cross product
Rectilinear Motion	1	Distance, displacement,
	2	Average velocity, Average acceleration
	3	Motion with uniform acceleration, Graphs
	4	Motion under gravity with graph
Projectile Motion	1	Projectile motion on horizontal plane
	2	Equation of trajectory
	3	Projectile motion on inclined plane
	4	Projectile Motion on a moving frame
Relative Motion	1	Relative motion in 1-D
	2	River Problem
	3	Wind, rain problem
	4	Velocity of approach, separation
	5	Collision, Maximum and minimum separation
NLM	1	Basic force, NLM 1st, 2nd, 3rd Law (Action Reaction)
	2	Tension, Normal force, System F.B.D.
	3	Problem of equilibrium & with acceleration
	4	Constrained motion (String constrained)Lecture 1
	5	Constrained motion (String constrained)Lecture 2
	6	Constrained motion (wedge constrained) Lecture 1
	7	Weighing machine, spring, Spring balance, spring and string cut problems
	8	Newton’s law for system
	9	Pseudo force
Friction	1	Causes of friction
	2	Kinetic friction, Problems based on kinetic friction
	3	Static friction
	4	Problems based on static friction
	5	Two block problem
	6	Two block problem+ discussion
Circular Motion	1	Circular Motion introduction
	2	Kinematics of circular motion
	3	Relative Circular Motion
	4	Circular motion in horizontal plane
	5	Circular motion in vertical plane

	6	Turning on roads / Banking of road, Centrifugal force
	7	Effect of earth's rotation
Work, Power & Energy	**1**	Calculation of work by constant force (Tension, Normal, Friction and Pseudo forces)
	2	Work done By variable forces, area under the graph
	3	Spring force, Kinetic energy
	4	Work energy theorem
	5	Problems based on work energy theorem
	6	Power, Conservative and non-conservative force
	7	Force-Potential energy relation & Equilibrium, Mechanical energy conservation & Discussion
	8	Types of equilibrium and potential energy curves and discussion
Current Electricity	**1**	Current, Current density
	2	Resistance
	3	Dependence of Resistance and Resistivity on Temperature
	4	Electric power & Battery
	5	Relative Potential
	6	KCL & KVL
	7	Combination of Resistors
	8	Symmetrical circuits & Grouping of cells
	9	Instruments (Galvanometer, ammeter)
	10	Instruments (volt meter, meter-bridge), Instruments (Post-office Box),
Capacitance	**1**	Capacitance of isolated Conductor & sharing of charges
	2	Capacitor & circuits problems
	3	Capacitor & circuits problems
	4	Combination of capacitors
	5	Charging and Discharging of capacitor
	6	Charging and Discharging of capacitor
	7	Dielectric, Theory & Problem
	8	Problems on dielectric
	9	Combination of parallel plates, Other types of capacitors
Magnetic effects of Current	**1**	Magnet + EMF due to moving point charge
	2	Bio Savart's law , B. due to straight wire,
	3	B. due to straight wire,
	4	B. due to arc, ring
	5	B due to solenoid, ampere's law
	6	Magnetic force on a moving point charge
	7	Circular path
	8	Circular path, Helical path
Earth Magnetism	**1**	Motion of charge E&B
	2	Magnetic force on a current, Carrying wire
	3	Earth magnetism, Magnetic Properties of matter
	4	Earth magnetism, Magnetic Properties of matter
EMI	**1**	Magnetic flux & Faraday's law , Lenz's law
	2	Examples on Faraday's law
	3	Motional EMF
	4	Motional EMF & Circuit problem
	5	Circuit problem with mechanics
	6	Time varying magnetic field
	7	Self inductance
	8	L–R series growth circuit
	9	Problem on L-R circuit
	10	Mutual Inductance, LC– Oscillation

Alternating Current	**1**	AC definitions, R, L, C Circuit
	2	R-L, L-C, L-C-R circuits
	3	Resonance
	4	Electric motor and generator, Transformer
Centre of Mass	**1**	Calculation of COM of system of particles
	2	COM of distributed mass system (Ring, disc, sphere)
	3	Cavity concept (Negative Mass concept)
	4	Motion of COM, Linear momentum conservation
	5	Spring–block problems
	6	Impulse and Impulsive force, Collision in 1-D / Head-on collision
	7	Collision in 2-D / Oblique collision
	8	Variable mass system, Rocket propulsion
Rigid Body Dynamics	**1**	Definition and types of motion, Moment of Inertia
	2	Theorems of MOI and their use, Radius of gyration
	3	Torque calculation, point of application of force
	4	Rotation about fixed axis, Derivation of t = Ia
	5	Angular momentum conservation
	6	CTRM
	7	CTRM, Pure rolling
	8	Angular momentum conservation in CTRM
	9	Angular momentum conservation in CTRM
	10	Rolling with slipping.Rolling on a moving object.
	11	Instantaneous axis of rotation (IAOR)
	12	Toppling
Simple Harmonic Motion	**1**	Linear SHM
	2	Graphs between various parameters
	3	Spring block system, Combination of spring
	4	Angular SHM, Simple Pendulum
	5	Compound pendulum, Superposition principle , Damped, Forced Oscillations, Resonance
Fluids	**1**	Static fluid,
	2	Pascal's Law, Barometer
	3	Buoyancy force
	4	Bernoulli's equation, continuity equation
	5	Venturimeter anddiscussion
Surface Tension	**1**	Definition, excess pressure
	2	Capillary action, surface energy
Elastisity and	**1**	Handout of elastisity and viscosity
String waves	**1**	Definition, equation of pulse, travelling wave
	2	Speed in string wave, Power, Intensity
	3	Superposition, Reflection
	4	Refraction, Interference
	5	Vibration in string waves / Various modes of vibration in standing waves
	6	Sonometer wire experiment
	7	String wave discussion
Sound Waves	**1**	Propagation of sound wave
	2	Equation of pressure wave
	3	Speed of sound, Intensity
	4	Loudness, Pitch
	5	Interference, Reflection and Refraction
	6	Air columns (Organ pipes)
	7	Beats, Doppler's effect

KTG & Thermodynamics	**1**	Assumptions, derivation of pressure, Maxwell equation, various speed
	2	Mean Free Path,Degree of freedom, Internal Energy
	3	System, Ideal gas, Various laws, various process
	4	Calculation of work, DU and heat (Q) for various process
	5	Free expansion, specific heats
	6	Second law of thermodynamics, heat engine and refrigerator
Calorimetry& Thermal Expansion	**1**	Principle of calorimetry
	2	Thermal expansion. in 1-D, 2-D, 3-D
	3	Time period, App weight, Temperature scales, Cubical expansion of fluid and effect on buoyancy force
Electrostatics	**1**	Electric Charge, Coulomb's Law
	2	Electrostatic Equilibrium
	3	Electric field & its significance
	4	Motion of charge particle in uniform electric field
	5	Electric field due to a point charge, ring & disc
	6	Electric field due to a line charge & sheet
	7	Electric field due to spherical, shell and solid sphere
	8	Electric field due to spherical, shell and solid sphere
	9	Electric field due to variable charge density in solid sphere
	10	Electric potential & potential difference, Potential due to a point charge
	11	Electric potential due to ring and disc.
	12	Electric potential due to hollow and solid sphere
	13	Potential energy of a point charge.
	14	Potential energy for system of point charges, Self Energy of shell
	15	Self energy of solid sphere and energy density
	16	Relation between E & V
	17	Electric dipole, Field and potential due to dipole
	18	Electric dipole in uniform & nonuniform electric field
	19	ELOF, Electric flux & Gauss's Law
	20	Application of Gauss's Law
	21	Application of Gauss's Law
	22	Conductors
	23	Earting of conductors & Van De Graff Generator
Gravitation	**1**	Newton's law of gravitation & Gravitation field intensity
	2	Gravitation Potential and G.P. Energy
	3	Kepler's Law and theory of satellite
Geometrical Optics	**1**	Introduction, Laws of reflection, Problems based on laws of reflection
	2	Problems based on relation between velocity of object and image
	3	Number of images with by combination of two plane mirrors
	4	Reflection through curve surface and Focal length of mirror
	5	Problems based on ray diagram and Mirror formula, Examples on spherical mirror
	6	Velocity of image and magnification
	7	Refraction at plane surface, Slab and composite slab
	8	Problems based on apparent depth and height, Problems of apparent shift
	9	Total internal reflection.
	10	Prism
	11	Prism
	12	Refraction at spherical surface
	13	Thin lens and lens formula
	14	Problems based on ray diagrams of lens
	15	Problems based on calculations with the help of lens formula
	16	Magnification, velocity of image

	17	Combination of lenses, lens-mirror combination
	18	Dispersion of light
	19	Dispersion of light
	20	Optical Instruments
	21	Optical Instruments
Wave Optics	**1**	Introduction of Interference of light
	2	Wave front YDSE Exp.
	3	YDSE oblique incidence
	4	Thin film interference
	5	Proof of Reflection and refraction by Huygens principal
Modern Physics-I	**1**	Photo electric effect, Exp. & observation
	2	Photo electric effect Exp. & observation, Davission-germer Experiment
	3	Photo electric effect, Exp. & observation
	4	Davission-germer Experiment
	5	Radiation force and pressure Matter waves
	6	Bohr model , Calculation of radius, velocity & Energy
	7	Bohr model (Spectrum), Nucleus motion
	8	Atomic collision
	9	X- rays
Nuclear Physics	**1**	Nuclear, Mass defect , Binding Energy
	2	Radioactivity
	3	a, b, g, decay, K Capture
	4	Statical law of radioactivity
	5	Fission & Fusion, Nuclear reactor
Semiconductor	**1**	Electrical conduction in semiconductor and energy band theory, Intrinsic and extrinsic semiconductors
	2	p-n junction diode & (V-I) characteristic , Zener diode, photo diode
	3	Transistors, (NPN, PNP)
	4	Common emitter, Common base, Common collector.
	5	Digital electronics and Logic Gates
POC	**1**	Communication channels, Space communication, Remote sensing, Line communication
	2	Optical communication, Optical fibre.
EMW	**1**	Electromagnetic Waves
Unit & Dimension	**1**	Handout of Unit & Dimension
Error	**1**	Handout of Error & Measurement
Measurement Error & Experiments	**1**	Verniercaliper ,screw gauge, serle's experiment
	2	Verniercaliper ,screw gauge, serle's experiment
Heat Transfer	**1**	Conduction, Steady state, Thermal Resistance
	2	Combination of slabs, Radiation, Stefan's law
		Newton's law of cooling, Wien's displacement law, Stephen boltzman law and solar constant