Bharatiya Vidya Bhavan Sohan Lal Public School
Annual Plan: 2021-22
Chemistry –XII

Book Name: Text book of Chemistry (Vol. I & II) NCERT
Lab Manual R.K.

Month	Chapters/topics	Learning Objectives	Online Activities /Art Integrated Activities	Outcomes of Learning
April	**SOLUTIONS** Types of solutions Concentration of solution in different units Henry's Law and Raoult's law Ideal and non-ideal solutions Colligative properties Abnormal molecular mass **SURFACE CHEMISTRY** Adsorption	• Understand the different types of solution • Express concentration of solution in different units. • State and explain Henry's law and Raoult's law. • Distinguish between ideal and non-ideal solutions. • Explain deviations of real solutions from Raoult's law. • Describe colligative properties and correlate these with molecular masses of the solutes • Explain abnormal colligative properties exhibited by some solutes in solutions • Describe interfacial phenomenon and its importance Define adsorption and classify it into physical and chemical adsorption• • Learn about factors controlling adsorption from gases and solutions on solids. Correlate adsorption results on the basis of Freundlich adsorption isotherms. Understand the nature of the colloidal state, learn the preparation purification	Determination of concentration of $KMnO_4$ solution to be done on the olabs. Assignments Preparation of lyophilic and lyophobic sol to be done on olabs.	Learners will be able to describe the types of solution Learners will be able to understand the Concentration of solution in different units Learners will be able to understand the Henry's Law and Raoult's law & its applications in life Learners will be able to understand the difference between ideal and non-ideal solutions. Learners will be able to know that what is Colligative properties & how to determine the molecular mass of solute Learners will be able to understand that why the molecular masses of electrolytes are abnormal Learners will be able to understand the differences between physical and chemical adsorption Learners will be able to know about Freundlich adsorption isotherms. Learners will be able to understand the various types of colloids & its specific name . Learners will be able to Understand the Preparation & properties of various types of colloids and its uses in life

April	Colloids Catalysis	and properties of various types of colloids and its uses • Describe the types of catalysis - homogeneous and heterogeneous Mechanism of enzyme catalysed reaction.	Assignments.	Learners will be able to understand the various types of catalysis - homogeneous and heterogeneous Learners will be able to understand about the various types of catalytic reaction takes place in life
May	**<u>Electrochemistry</u>** Electrochemical cell Nernst equation Electrolytic conductors , conductivity and molar conductivity Kohlrasuch law Electrolysis Corrosion Primary and secondary cell	• Describe an electrochemical cell and differentiate between galvanic and electrolytic cell, define standard potential of the cell • Use Nernst equation for calculating the emf of galvanic cell Develop relation between standard potential of the cell and .Gibbs energy of reaction and its equilibrium constant. Differentiate between ionic (electrolytic) and electronic conductivity Define resistivity , conductivity and molar conductivity of ionic solutions. Learn the method for measurement of conductivity of electrolytic solutions and calculation of their malar conductivity .Justify the variation of conductivity and molar conductivity of solutions with change in their concentration Enunciate Kohlrausch law and learn its applications. Understand the quantitative aspects of electrolysis Understand corrosion as an electrochemical process. Describe the construction of some primary and secondary	Variation of cell potential in Zn/Zn2+//Cu2+/Cu with change in concentration of electrolyte will be studied by students in olabs. Assignments will be given.	Learners will be able to understand the diffrences between galvanic and electrolytic cell Learners will be able to understand to calculate the emf of galvanic cell and .Gibbs energy of reaction and its equilibrium constant. Learners will be able to know that the types of conductors Learners will be able to understand to measure the conductivity of electrolytic solutions and calculation of their malar conductivity Learners will be able to understand the variation of conductivity and molar conductivity of solutions with change in their concentration Learners will be able to know about the Kohlrausch law and learn its applications. Learners will be able to Understand the quantitative aspects of electrolysis Learners will be able to Understand about the corrosion and how to prevent it Learners will be able to Understand about the types of cell and use of it in

		batteries and fuel cells.		life
JUNE 1st to 14th	**d & f- BLOCK ELEMENTS** General Introduction & Electronic configuration Characteristics of d and f block elements Preparation and properties of $K_2Cr_2O_7$, Preparation and properties of , KMnO4 Lanthanides contraction & Actinides	Justify the position of the d-and f-blocks of elements in the periodic table • Learn the electronic configurations of d-and f-block elements. • Know the general properties of the transition elements with special reference to trends in periodic table. Describe the preparation and properties of, $K_2Cr_2O_7$, $KMnO_4$ Describe the properties of f-block elements (lanthanides and actinides). • Describe the cause and consequence of lanthanides contraction.	Assignments Power point presentation will be shared on online screen	Learnres will be able to understand the position of the d-and f-blocks of elements in the periodic table & its electronic configurations Learnres will be able to understand the general properties of the transition elements Learners will be able to learn the preparation and properties of, $K_2Cr_2O_7$, $KMnO_4$ Learners will be able to understand the general properties of the properties of f-block elements & Lanthanides & Actinides contraction
JUNE 15th TO 30th	**SUMMER BREAK**			
JULY	**CHEMICAL KINETICS** General Introduction & Rate of reaction Avg. rate and instantaneous rate Order and molecularity	Define the rate of reaction • Define the average and instantaneous rate of a reaction and express it in terms of change in concentration of either of the reactants or product with time • Distinguish between elementary (one step) and complex reactions (multiple steps)	Effect of concentration on rate of reaction between sodium thiosulphate and HCl will be studied on olabs.	Learners will be able to know about chemical kinetics & rate of reaction Learners will be able to Understand the average and instantaneous rate of a reaction Learners will be able to Understand the differences between elementary (one step) and complex reactions (multiple steps) Learners will be able to Understand the

		• Describe the molecularity of elementary reactions and order of simple and complex reactions		difference between Order and molecularity of reactions
	Rate law	• Define rate constant and describe the dependence of the rate of reaction on the concentration of the reactants	Assignments	Learners will be able to Understand the Integrated rate expression for zero and first order reaction
	Integrated rate expression for zero and first order reaction	• Derive the integrated rate expression for zero and first order reaction • Define half life time of a reaction Correlate half life with rate constant and initial concentration of one of the reactants.		
	Arrhenius equation	• Describe the temperature dependence of rate constant in terms of Arrhenius equation	Students will be asked to prepare the Concept Map of the chapter.	Learners will be able to Understand the temperature dependence of rate constant in terms of Arrhenius equation
AUGUST	**HALOALKANES AND HALOARENES** IUPAC nomenclature Nature of C-X bond in haloalkanes and haloarenes.	Develops skill in writing trivial and IUPAC nomenclature of Haloalkanes and Haloarenes.		Learners will be able to know how to write the trivial and IUPAC name of Haloalkanes and Haloarenes.
	Preparation of haloalkanes and haloarenes	• List the reactions involved in the preparation of Haloalkanes and Haloarenes	Flow charts of Organic Reactions will be shared on screen.	Learners will be able to understand the methods of preparation Haloalkanes and Haloarenes
	Physical properties Chemical properties and reaction mechanisms.	• Describe and explain their physical and chemical properties.		Learners will be able to understand the Physical and chemical properties and nature of C-X bond in haloalkanes and haloarenes.
	Stereo chemistry of nucleophilic	• Understand the mechanism and stereo chemistry	Stereochemistry will be explained with the help of balls and sticks.	Learners will be able to know the mechanism and stereo chemistry involved in nucleophilic substitution

	substitution reaction	involved in nucleophilic substitution reaction.	Assignments	reaction. Learners will be able to distinguish between SN1 an SN2 mechanisms. Learners will be able to distinguish between properties of haloalkanes and haloarenes.
August	ALCOHOLS, PHENOLS AND ETHERS IUPAC nomenclature Preparation & properties of alcohols Preparation & properties of phenols Preparation & properties of ethers, Uses of alcohols, phenols and ethers.	Name of alcohols, phenols and ethers according to trivial and IUPAC system of nomenclature. • Describe and explain the reactions involved in the Preparation & properties of alcohols • Describe and explain the reactions involved in the Preparation & properties of phenols • Describe and explain the reactions involved in the Preparation & properties of ethers Explain the uses of alcohols, phenols and ethers.	Chemical tests to detect the presence of Alcohols and phenols will be done in the lab.	Learners will be able to know how to write the trivial and IUPAC name of alcohols, phenols,ethers, Learners will be able to Understand the Preparation & properties of alcohols Learners will be able to Understand the Preparation & properties of phenols Learners will be able to Understand the Preparation & properties of ethers Learners will be able to Understand the uses of alcohols, phenols and ethers In our life.
September 1st to 14th	**Revision**			
September 15th to 30th	**FIRST TERM EXAMS**			
October	ALDEHYDES, KETONES AND CARBOXYLIC ACID IUPAC nomenclature, preparation & properties aldehydes ketones, distinction between aldehydes & ketones Feedback test preperation of carboxylic acid properties of	Write the trivial and IUPAC names of aldehydes, ketones, • Describe the important methods of their preparation and reactions of aldehydes & ketones • Understand the chemical reactions of these classes of compounds They will be tested about knowledge, understanding, application and skill of the topic • Describe and explain the reactions involved in the	Students will perform chemical tests to identify aldehydes, ketones and carboxylic acids in lab. Assignments	Learners will be able to know how to write the trivial and IUPAC name of aldehydes, ketones, Learners will be able to Understand the Preparation & properties of aldehydes & ketones Learners will be able to distinguish between aldehydes & ketones Learners will be able to Understand the Preparation & properties of carboxylic acid

	carboxylic acid Some important members of aldehydes,ketones and carboxylic acid	preparation of carboxylic acid • Understand the chemical reactions of carboxylic acid • Learn the chemistry of some commercially important members of these families of compounds. They will be tested about knowledge, understanding, application and skill of the topic		Learners will be able to know about some important members of aldehydes,ketones and carboxylic acid
October	AMINES IUPAC nomenclature, preparation of Amines properties of Amines , preparation and properties of Diazo Compounds) Test of Amines	• Write the trivial and IUPAC names of amines. • Describe the important methods of preparation of Amines Basic character of Amines Reaction with Electrophiles and miscellaneous Reactions • Describe the important methods of preparation of Diazo compounds Reactions involving Displacement of Diazo group,and Retention of Diazo group Distinguish between the primary,secondary and tertiary amines	Students will perform dye test and carbylamine test for primary amines.	Learners will be able to know how to write the trivial and IUPAC name of amines Learners will be able to Understand the Preparation & properties of amines Learners will be able to Understand the Preparation & properties of amines Learners will be able to perform the test to distinguish between the primary,secondary and tertiary amines amines
October	BIOMOLECULES Carbohydrates, proteins nucleic acid Vitamin	Learn about the preparation, structure,properties and uses of carbohydrates Describe the primary, secondary and tertiary structures of proteins List their functions in human body. • Differentiate between DNA and RNA • Describe the double helical structure of DNA Classify Vitamins and appreciate its importance and also list	Assignments	Learnres will be able to learn the preparation, structure,properties and uses of carbohydrates Learnres will be able to learn the structures of proteins and its functions in human body. Learners will be able to understand the differences between DNA and RNA and its functions in life Learners will be able to understand the various types of Vitamins, its importance and also list the diseases caused by the deficiency of these

		the disease caused by the deficiency of these vitamins.		vitamins.
November	P-BLOCK ELEMENTS General trends in the chemistry of elements of group 15, 16, 17 and 18 Preparation and properties of certain compounds of these groups Structure of oxo- acid of group 15, 16 & 17 and some compounds of Xenon.	Appreciate the general trends in the chemistry of elements of group 15, 16 ,17.and 18. To know about the allotropes of sulphur • Describe the preparation, properties and uses of Oxygen, ozone,sulphur-di- oxide, Sulphuric acid, chlorine and hydrochloric acid. Flurides and oxides of Xenon. • Draw the structure of oxoacid of sulphur, halogens and some compounds of Xenon.	Students will be asked to prepare the list of all chemical equations as given in NCERT. Assignments	Learners will be able to understand the general trends in the chemistry of elements of group 15, 16 ,17.and 18. Learners will be able to learn the preparation and properties of certain compounds of these groups Learners will be able to Draw the structure of oxoacid of sulphur, halogens and some compounds of Xenon.
November November	CO-ORDINATION COMPOUNDS Some Important Terms used in Co-ordination compounds Nomenclature Isomerism Bonding in coordination compounds: Werner's ,Valance bond and crystal field theory of Co-ordination compounds Stability of coordination compound Metal carbonyls, Application of coordination	Know the meaning of the terms: co-ordination entity (complex) central atom, ligand, co-ordination number, co-ordination polyhedron, oxidation number, denticity and chelation • Learn the rules of nomenclature of co- ordination compounds. Write the formulae and names of mononuclear co-ordination compounds. • Describe and predict the different types of isomerism in coordination compounds Understand the nature of bonding in co-ordination compounds in terms of Werner's, Valence Bond and Crystal Field theories Explain the stability of co-ordination compounds	Preparation of double salt of ferrous ammonium sulphate and potash alum.	Learners will be able to know the meaning of some important terms Learners will be able to Understand the different types of isomerism in coordination compounds Learners will be able to Understand the nature of bonding in co-ordination compounds in terms of Werner's, Valence Bond and Crystal Field Theories Learners will be able to know the stability of co-ordination compounds Learners will be able to Understand

		• Briefly describe the bonding in metal organometallic compounds. Appreciate the importance and applications of co- ordination		the Metal carbonyls, Application of coordination compounds in our life
November	SOLID STATE General Characterstics of Solid :	*describe general characteristics of solid state;		Learners will be able to Understand the different types of isomerism in coordination compounds
	Classification of solids	• distinguish between amorphous and crystalline solids;	Work-Sheet-1	Learners will be able to Understand the nature of bonding in co-ordination compounds in terms of Werner's, Valence Bond and Crystal Field theories
	Types of unit cell	• classify crystalline solids on the basis of the nature of binding forces;		Learners will be able to know the stability of co-ordination compounds
	Types of packing and efficiency of packing in solids	define crystal lattice and unit cell; explain close packing of particles;describe different types of voids and close packed structures;	EX-1:3 to 1:6-Itext-Q-1.18	Learners will be able to Understand the Metal carbonyls, Application of coordination compounds in our life
	Density of unit cell of slods	• correlate the density of a substance with its unit cell properties;		Learners will be able to find out the density of solid and solve the numericals based on it
	Imperfection of solid	• describe the imperfections in solids and their effect on properties;	Work-Sheet-1A	Learners will be able to understand the differente type of imperfection
December	**SECOND TERM EXAMS**			
January-April	**REVISION/Board Exams**			

BIOLOGY XII

Book Name: Text book of Biology NCERT

Biology Lab Manual Evergreen

MONTH	CHAPTERS/ TOPICS	SUB TOPICS	LEARNING OBJECTIVES	ACTIVITIES/ Art Integrated Activities	OUTCOMES OF LEARNING
APRIL	**Unit 1** **Ch. 1**Sexual Reproduction in Flowering Plants	Flower Microsporogenesis Megasporogenesis Pollination Double fertilization Endosperm Embryo Seed Apomixis Polyembry ony	*Discuss sexual reproduction in plants, pollination, fertilization in plants ad pollen pistil interactions.	*Study of pollen germination on a slide (thr' OLab/ Virtual lab *Flowers adapted to pollination by different agencies in the surroundings can be studied *Controlled pollination- emasculation, tagging and bagging(thr' OLab/ Virtual lab) * Worksheets *e-assignments	*Different terms like double fertilization, autogamy,geitonogamy and draw the diagrams ofmicrosporangium, ovule,different types of seeds and embryo development.
MAY	**2. Human reproduction**	Male Reproductive System Female Reproductive System Gametogenesis Menstrual Cycle fertilisation &implanta-	*Explain sexual reproduction in man, male and female reproductive systems, spermatogenesis, Oogenesis and menstrual cycle.	*Identification of stages of gamete development i.e T.S Testis & T.S Ovary thr' permanent slides (thr' OLab/ Virtual lab) *Identification of T.S. Blastula thr' permanent Slide(thr' OLab/	The students will come to know about: *Different terms like Spermatogenesis, Oogenesis, facts on concepts to human reproduction and diagrams of male and female reproductiveorgans and also explain post fertilization

	3.Reproductive Health	tion Pregnancy &develop-ment Parturition &Lactation Reproductive health birthcontrol MTP STD's	*Methods of Contraception and medical termination of pregnancy, amniocentesis, Infertility and ASR technologies :IVF,ZIFT, GIF.	Virtual lab) * Worksheets *e-assignments * Worksheets *e-assignments	events The Students will learn about: *reproductive health w.r.t. problems and Strategies , *explain the process of Medical Termination of Pregnancy, *causes of STD's.and factors causing infertility
JUNE 1-14	**UNIT 2** **4. Principles of inheritance and Variations**	Inheritance of one gene Inheritance of two genes Co-dominance Multiple llelism	*Monohybrid cross and Dihybrid cross *Incomplete Dominance Codominance, multiplealleles and inheritance of blood groups	* Mendelian Inheritance using seeds of different colour/ sizes of any plant (thr' Olab/ Virtual lab) Can be performed at home with capsules and tablets. *Prepared pedigree charts of any one of the genetic traits such as rolling of tongue, blood groups, ear lobes , widow's peak and colour blindness.	The students will learn about: *Transmission of characters through Monohybrid and dihybrid crosses and laws i.e Law of Dominance Law of Segregation and Law of Independent Assortment The students will be able to know and explain: *explain terms like allele, gene incomplete dominance, codominance
JUNE 15 to 30		**SUMMER BREAK**			

JULY	**4. Principles of inheritance and Variations (CONTD.)**	Linkage Sexdetermination Pedigree analysis Mendelian disorders Chromosomal Disorders	pleiotropy, chromosome theory of inheritance, chromosomes and genes, sex determination, various mendelian disorders.	* Worksheets *e-assignments	The students will be able to know and explain: *chromosomal theory ofinheritance and analysis of pedigree charts, *sex determination and mutations
AUGUST	**5. MOLECULAR BASIS OF INHERITANCE**	Search for Genetic Material DNA & RNA world DNA packaging Replication Transciption Translation Gene expression Operon Model Human and Rice Genome Project	* Structure of DNA and RNA, DNA Replication, Central dogma, transcription, Genetic code,Gene expression and regulation-lac operon Human and rice genome project, DNA fingerprinting	* Worksheets *e-assignments	The students will learn about : *Terms like replication, transcription, translation, Explain template strand and coding strand, various experiments conducted during molecular basis of inheritance and describe Human and Rice Genome project
SEPTEMBER 1 to 14 **SEPTEMBER 15 to 30**		**Revision for term 1 examination**. **TERM 1 EXAMINATION**			
OCTOBER 1-10	**6. Human Health and Diseases**	Pathogens, Parasites causing human diseases and their control Basic concepts of	*Basic concepts of immunology, Vaccines cancer, HIV and AIDS, Malaria, Adolescence, Drug and Alcohol	*Common disease causing organisms like *Ascaris, Entamoeba, Plasmodium,*any fungus causing	The students will learn *Basic concepts of two types of munity: innate and humoral, vaccine and immunization,

		Immunology and vaccines	abuse.	ringwormthrough specimens or slides * Worksheets *Assignments	bacterial viral and fungal diseases, Elephantiasis, Cancer , AIDS, Life cycle of Plasmodium, Drugs and their sources and effects.
OCTOBER 11-20	**7.Microbes in Human**	Roles of microbes in household, food processing, industries, sewage treatment, bio agents and bio fertilizers.	*Importance of microbes in household food processing ,industrial production, sewage treatment, energy generation as biocontrol agents and biofertilizers	*Study of the effect of different temperatures and three different pH on the activity of Salivary amylase on starch. * Worksheets *Assignments	The students will be made to understand the concepts of: * microbial actions and their role in various household products, industrial preparations,
OCTOBER 21-31	**8. Principles and Processes of Biotechnology**	rDNA technology tools and enzymes	*Recombinant DNA technology and its importance	*Isolation of DNA from plant..spinach or banana	*awareness of biotechnology acc to various foundations, tools and techniques for biotechnology with special emphasis on geneticengineering, GMO'sbiotechnological issues, biosafety etc.
NOVEMBER	**9..Biotechnology and its applications** **10. Organisms and Population**	Importance of biotechnology in agriculture In medicines In gene therapy GMO's Habitat and Niche Population and Ecological	*Gene therapy, Genetically modified organisms- Bt crops, transgenic animals, biopiracy and bipatent *Habitat and Niche, population and ecological adaptations, Population interactions : mutualism, parasitism and also about	* Worksheets *Assignments *ClassTests Practicals: *Study the plant	*Importance of Biotechnology in Transgenic Organisms, Insect Pest Resistance, Bt Cotton, and transgenic organisms. The students will learn about : *Hierarchy of organisms and population, Habitat and Niche , Population

		Adaptations Population ineractions	population growth models, population attributes: growth rate, birth rate, death rate and pyramids of age distribution.	population density by Quadrat method *Collect and study soil from two different sites and study them for texture, moisture content,pH and water holding capacity.	growth rates and age pyramids, J shaped and S shaped growth curves, Population interactions ..mutualism, parasitism, predation, ammensalism, commensalism, growth rates, birth and death rates.
	11.Biodiversity and its conservation	Concept of biodiversity, its loss, conservation, biosphere reserves, national parks	*Concepts, patterns, importance, loss, conservation of biodiversity, hotspots,endangered organisms,extinction, Red Data Book, biosphere reserves, national parks and sanctuaries	*Study the presence of suspended particulate matter in air at two widely different sites	*Importance of biodiversity and its concept latitudinal and altitudinal distributions, Conservation of biodiversity Endangered and extinct species, Red data book and the data of organisms, Hot spots, sacred grooves, biodiversity for narrow and broad utility ,cryopreservation.
DECEMBER 1 to 7 DEC 7 2020-JAN 62021		**REVISION TERM 2 EXAMINATION**			
JAN, FEB, MARCH and APRIL		**REVISION& BOARD EXAMS**			

MATHEMATICS XII

Book Name :Text book (I & II) NCERT

Month	Name of the Chapter/Topic	Sub- topics	Learning Objectives	Online Activities /Art Integrated Activities	Outcome of Learning
April	• Linear Programming • Continuity and differentiation	Linear programming and its formulation Continuity and differentiation Derivatives of exponential, lograthmic functions Differentiation of functions in parametric forms Second order derivatives	Solutions to world problems graphically Points of discontinuity of functions, derivatives of exponential, log functions	e-practice sheets and project Discussion of a case study based on LPP Practical to check continuity of the function at a point (OLab)	To find solutions to problems graphically To find points of discontinuity and derivatives of various types of functions
May	• Application of Derivatives • Indefinite Integration	Increasing and decreasing functions Tangents and normal Maxima and minima Integration as inverse of differentiation Methods of integration Integration by partial fractions and parts	Increasing and decreasing function, equation of tangents and normal, maxima and minima Indefinite integrals	Practical on maxima and minima (OLab) Model making to show how can we maximize the area of a square e-practical sheets and e-assignments	To identify increasing and decreasing functions, equation of normal and tangent, to find maxima and minima To solve indefinite integrals
June 15 june – 30 june	• Definite Integration Summer break	Fundamental theorem of Calculus Evaluation of definite integrals by substitution Properties of definite integrals	Definite integrals Properties of definite integral	e-practical sheets and e – assignments	To solve definite integrals using properties

July	• Matrices and Determinants • Relations and Functions	Types of matrices Operations on matrices Transpose of a matrix Symmetric and skew-symmetric matrices Invertible matrices Types of relations Types of functions	Add two matrices, symmetric and skew symmetric matrices, inverse of a matrix, area of a triangle Define relation Identify reflexive, symmetric and transitive relations, Equivalence relation Identify one-one, onto functions	e - assignments Practical to demonstrate an equivalence relation (OLab) Practical on a function which is onto but not one-one (OLab)	To add matrices, multiply, find inverse, to solve system of equations To identify an equivalence realation To identify one-one, onto functions
August	• Application of Integration • Differential Equation	Area under simple curves General and particular solution of a differential equation Methods of solving first order differential equations	Area using integration Degree and order of a differential equation Solving the equation using variable separable, homogeneous, linear differential equation method	e - assignments e – assignments	To find area using integration To identify the degree and order and to solve the equation with suitable method
September 15 September-30 September	• Probability First Term Online Exams	Conditional Probability, multiplication theorem, Addition theorem, independent events, Bayes Theorem, Random Variables and its probability distribution	Probability using conditional formula, solve the problem by Bayes Theorem, probability distribution of different random variables	e - practice sheets and e – assignments Practical on Conditional Probability (Olab) Discussion of case study on Probability	To find the probability using conditional probability formula, To identify and solve the problem by Bayes Theorem, To find probability distribution of different random variables.
October	• Vector Algebra • Three Dimensional	Introduction, types of vectors, multiplication of vectors by a scalar, addition of vectors, dot and cross product	Dot and cross product of two vectors, projection of one vector on other, to analyze vectors if dot product or cross product is zero	e - practice Sheets Practical to prove angle in a semi-circle is a right angle using vectors. e - practice Sheets	To find dot product and cross product of two vectors, to find projection of one vector on other, to analyze vectors if dot or cross product is zero

	Geometry	Direction cosines and ratios of a line, equation of a line in space, shortest distance between two lines, equation of plane, coplanarity of two lines, distance of a point from a line	Equation of a line in space in vector and cartesian form, equation of plane in vector and cartesian form, distance between two lines, distance between a point from a plane		To find the equation of line in space in cartesian and vector form, to find equation of plane in cartesian and vector form, to find the distance between two lines, to find the distance between from a point to a plane
November	• Inverse Trignometric Functions • Revision	Basic Concepts	Inverse values of trigonometric functions	e – assignment	To find inverse values of trigonometric functions
December December 7,2020 – January 6,2021	• Second Term offline exams				
January February March	• Revision • Pre- Boards				

PHYSICS XII

Book Name: **Text book of Physics (Vol. I & II) NCERT**

Physics Lab Manual ARIHANT

MONTH	CHAPTERS/ TOPICS	Sub- topics	LEARNING OBJECTIVES	ACTIVITIES/ Art Integrated Activities	Outcomes of Learning
APRIL	**Unit1 (Electrostatics)** **Ch 1 Electric charges and fields**	1)ElectricCharges; Conservation of charge, Coulomb's law-force between two point charges, forces between multiple charges; superposition principle and continuous charge distribution.	To make the learners to understand the theoretical and mathematical concepts of Electric Charges and its Properties and Electrostatics forces and fields of different charge distributions.	Small activities like rubbing of glass rod with silk cloth or inflated balloon can be performed to demonstrate the concept of charging by friction and induction. Worksheets e-assignments	Students acquires the basic knowledge of Electric charges, concept of electrostatic force in vector form different distribution of charges, Electric field produced by different distribution of charges and its
		2)Electric field, electric field due to a point charge, electric field lines, electric dipole, electric field due to a dipole, torque on a dipole in uniform electric fleld.			Mathematical analysis. Student will be able to relate the phenomena of charging of a body with daily life.

		3)Electric flux, statement of Gauss's theorem and its applications to find field due to infinitely long straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell (field inside and outside).			
APRIL	**<u>Ch 2 Electrostatic Potential and Capacitance</u>**	1) Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges; equipotential surfaces, electrical potential energy of a system of two point charges and of electric dipole in an electrostatic field. 2) Conductors and insulators, free charges and bound charges inside a conductor. 3) Dielectrics and electric olarization, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor.	To make the learners to understand the concept of Electric potential due to different charge distributions and its relation between electric field. Also the students will learn about the capacitance, dielectrics and its polarization.	Demonstration using two metal plates, electric wires and multimeter will be given online to show the construction of a capacitor and dependance of capacitance on various factors. e-assignment	Student will be able to relate the Electrical potential with electric field. Student will be able to understand the working of charge storing device i.e, capacitor.

MAY	**<u>Unit 2</u>** **<u>Current Electricity</u>**.	1)Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; Ohm's law, electrical resistance, V-I characteristics (linear and non- linear)	To make the learners to understand the concept Electricity, resistance and resistivity and the parameters affecting it with its link to our daily life.	1. To determine resistance per cm of a given wire by plotting a graph for potential difference versus current.(using virtual lab) 2.To find resistance of a given wire using metre bridge and hence determine the resistivity (specific resistance) of its aterial. (using virtual lab) 3.To compare the EMF of two given primary cells using potentiometer. resistance) of its material.(using virtual lab) 4.To determine the internal resistance of given primary cell using potentiometer. resistance) of its material. .(using virtual lab) e-assignments revision test	Students are able to understand the concept of Potential difference and current and also the process of finding the unknown current in a loop using KVL and KCL.
		2) electrical energy and power, electrical resistivity and conductivity, Carbon resistors, colour code for carbon resistors; series and parallel combinations of resistors; temperature dependence of resistance. Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel	To make the learners to understand the concept of different electrical devices like wheat stone bridge and its application in meter bridge and potentiometer with real life application.		Students will be able to understand the practical application of resistors and cells and it different combination in real life. Students will be able to operate different electrical instruments like POT, Meter bridge,
		3) Kirchhoff's laws and simple applications, Wheatstone bridge, metre bridge. 4)Potentiometer - principle and its applications to measure potential difference and for comparing EMF of two cells; measurement ofcell			Galvanometer, Voltmeter, ammeter etc. also they learned to find the least count of given measuring instrument.

JUNE **1 to 14**	**<u>Unit 3</u>** **<u>Magnetic effects of current and Magnetism</u>**	1) Concept of magnetic field, Oersted's experiment. 2) Biot - Savart law and its application to current carrying circular loop. Ampere's law and its applications to infinitely long straight wire. Straight and toroidal solenoids (only qualitative treatment), force on a moving charge in uniform magnetic and electric fields, 3) current. sensitivity and conversion to ammeter and voltmeter	To make the learners to understand the concept relation between electricity and magnetism and analysis magnetic field for different kind of symmetrical structure.	Experimental demonstration of Oersted's experiment (using virtual lab) e-assignments revision test	Student will learn about the relation between electricity and Magnetism and different methods to find the Magnetic field due to different types of conductor. Student will learn about the force between two parallel conductors and its mathematical analysis depending upon the directions of current.
JUNE 15 to 30		**SUMMER BREAK**			
JULY	**Ch 4 Moving charges and Magnetism**	Force on a current-carrying conductor in a uniform magnetic field, force between two parallel current-carrying conductors-definition of ampere, torque experienced by a current loop in uniform magnetic field;Moving coil galvanometer	To make the learners to understand the different kinds of devices like voltmeter, ammeter, galvanometer and their conversions.		Student will learn about the conversion of galvanometer into ammeter and voltmeter of desired range

		Current loop as a magnetic dipole and its magnetic dipole moment, magnetic dipole moment of a revolving electron, magnetic elements of Earth.	magnetic material and earth's magnetic field.	e-assignment and revision test	

AUGUST	**Unit 4** **EMI and AC** **Ch 6 EMI**	1) Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Eddy currents. 2) Self and mutual induction.	To make the learners to understand the concept Electromagnetic Induction of single and double coil.	e-assignment and revision test	Students will learn about the different method to induce an emf in a given conductor which is useful to understand the concept of Mutual and self induction.
AUGUST	**Ch 7 AC**	1) Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; LC oscillations (qualitative treatment only), LCR series circuit, resonance; power in AC circuits, 2) AC generator and transformer.	To make the learners to understand the application based concept of Electromagnetic Induction(Generator, Transformer, choke coil)	.	Students acquires the basic knowledge about the Principle construction working and real life application of Transformer and Dynamo

AUGUST	**Unit 5** **Electromagnetic Wave** **Ch 8 EMW**	1.Electromagnetic waves, their characteristics, their Transverse nature (qualitative ideas only).	To make the learners tounderstand the generation and real life application of electromagnetic wave depending upon the value of wavelength and frequency.	e-assignment and revision test	Student acquires knowledge about the Practical application of EMW in our Daily life.
		2.Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X- rays, gamma rays) including elementary facts about their uses.			
Sepetmber 1 to 14 September 15 to 30		Revision for term 1 examination. TERM 1 EXAMINATION			

OCTOBER	**Unit 6 Optics** **Ch 9** Ray Optics and Optical Instruments	**Ray Optics:** refraction of light, total internal reflection and its applications, optical fibres, refraction at spherical surfaces, lenses, thin lens formula, lensmaker's formula, magnification, power of a lens, combination of thin lenses in contact, combination of a lens and a mirror, refraction and dispersion of light	To make the learners to understand the applications of different lenses and optical instrument in our daily life.	1.To find the focal length of a convex lens by plotting graphs between *u* and *v* or between *1/u* and *1/v*. (using virtual mode) 1. To find the focal length of a concave lens, using a convex lens.	Student will learn about the different types of lenses and respective ray diagrams for image formation along the mathematical tactics and Analysis.

	through a prism. **1)** Scattering of light - blue colour of sky and reddish apprearance of the sun at sunrise and sunset. **2)** Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.		(using virtual mode) 2. To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation. (using virtual mode) 3. To determine refractive index of a glass slab using a travelling microscope. (using virtual mode)	Student will learn the different optical phenomena of in our daily life like advanced sunriseand delayed sunset etc.
Ch 10 Wave Optics	**1)Wave optics:** Wave front and Huygen's principle, reflection and refraction of plane wave at a plane surface using wave fronts. 2)Proof of laws of reflection and refraction using Huygen's principle. 3) Interference, Young's double slit experiment and expression for fringe width, coherent sources and sustained interference of light, diffraction due to a single slit, width of central maximum resolving power of microscope and astronomical telescope, polarisation, plane polarised light, Brewster's law, uses of plane polarised light and Polaroids	To make the learner to understand the difference between ray optics and wave optics and different optical phenomena such as interference, diffraction and polarization of a light wave.	e-assignment and test Power point presentations	Student are able to differentiate between the ray and wave nature of a light

November	**Unit 7 Dual Nature of Radiation and Matter** **Unit 8 Atoms and Nuclei**	1)Dual nature of radiation, Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light. 2)Matter waves-wave nature of particles, de-Broglie relation, 1)Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum. 1)Composition and size of nucleus, 2)Mass-energy relation, mass defect; binding energy, nuclear fission, nuclear fusion.	To make the learners to understand the dual nature of radiation of light as practical and wave. To make the learners to understand the basic structure of atoms and nucleus proposed by different scientists and its importance in our life.	Assignments Assignments Power point presentations	Learners will be able to understand the dual nature of light (Wave and Particle) along with experimental and mathematical verification. Learners will be able to understand the Concept of atoms and nuclei with help of different models developed by different scientists (Rutherford's model, bohr's model etc.)
November **DEC1 to 7 DEC 72020-JAN 6 2021 JAN, FEB, MARCH and APRIL**	**Unit 9** **Electronic Devices** **Ch 14 Semiconductor Electronics:Materials, Devices andSimple Circuits** **REVISION** **TERM 2 EXAMINATION** **REVISION & BOARD EXAMS**	1)Energy bands in conductors, semiconductors and insulators (qualitative ideas only) Semiconductor diode - I-V characteristics in forward and reverse bias, diode as a rectifier; Special purpose p-n junction diodes: LED, photodiode, solar cell .	To make the learners tunderstand the importance and significance of semiconducting devices in our daily and how the are different from conductor and insulator by explaining different semiconducting devices.	To draw the I-V c characteristic curve for a p-n junction in forward a and reverse bias. Power point presentations	Learners will be able to understand the Concept of Conductors, Insulator and semiconductor with the help of Band Energy Theory. Learners will be able to understandtheClassificationo f semiconductors along with Practical applications in PN diode, Rectifiers, Optoelectronic devices.

PHYSICAL EDUCATION XII

MONTH	CHAPTER/TOPIC	LEARNING OBJECTIVES
April	**Planning in Sports**	**To make the learners understand the theoretical and practical concepts of planning various committees, tournaments and specific sports programmes**
May	**Sports and Nutrition** **Yoga and Lifestyles**	**Balance diet and nutrition macro and micro nutrition nutritive and non-nutritive components of diet. Eating for weight control, pitfalls of dieting, food intolerance and food myths** **To make the students understand to do asanas practically and preventive measures for obesity, diabetes, asthma and hypertension.**
June **June 15 – June 30**	**Physical education and sports for CWSN** **Summer Break**	**Learners will understand the concept of disability and disorder. Types of disability its causes and nature. Types of disorder its causes and nature. Disability etignettes strategies to make physical activity for children with special needs.**
July	**Children and Women in sports**	**To make the students understand motor development. Exercise guidelines at different stages of growth and development. Common postural deformities, knock knee, flat foot, round shoulder, lordosis, kyphosis, bow legs and scolosis. Sports participation of women in India.**
August	**Test and measurement in Sports**	**Motor fitness test. Measurement of cardiovascular fitness: computation of fitness index; Rikli and Jones Senior citizen fitness test.**

September **September 15,2020 – September 30, 2020**	**Physiology and Injuries in Sports** **Biomechanics and Sports** **First Term Online Exam**	**Physiological factors Effect of exercise on : Cardio respiratory system, muscular system, Sports injuries classification, First Aid – aim and objectives** **Meaning and importance of biomechanics in sports, types of movement, flexion, extension, abduction, adduction, Newtons law of motion and its application in sports**
October	**Psychology and Sports**	**Personality : Its definition and types. Motivation its types and techniques, meaning concept and types of aggression in Sports**
November	**Training in Sports**	**Strength : Definition types and methods of improving strength, Isometric, isotonic, isokinetic endurance : types and methods. Continuous training, interval training, fartlek training, Speed : types and methods, acceleration run, pace run, flexibility : types and methods: Biallistic method, static stretching,passive stretching, PNF, Coordinative ability : types and definition**
December 6, 2020 – January 6, 2021	**Second Term Exams**	
January **February** **March**	**Revision** **Pre- board exams**	

INFORMATICS PRACTICES 065

Book Name: Informatics Practices with python : Preeti Arora
Unit 1: Data Handling using Pandas –I

Introduction to Python libraries- Pandas, Matplotlib. Data structures in Pandas - Series and Data Frames.
Series: Creation of Series from – ndarray, dictionary, scalar value; mathematical operations; Head and Tail functions; Selection, Indexing and Slicing.
Data Frames: creation - from dictionary of Series, list of dictionaries, Text/CSV files; display; iteration; Operations on rows and columns: add, select, delete, rename; Head and Tail functions; Indexing using Labels, Boolean Indexing;
Importing/Exporting Data between CSV files and Data Frames.
Data Visualization
Purpose of plotting; drawing and saving following types of plots using Matplotlib – line plot, bar graph, histogram
Customizing plots: adding label, title, and legend in plots.

Unit 2: Database Query using SQL

Math functions: POWER (), ROUND (), MOD ().
Text functions: UCASE ()/UPPER (), LCASE ()/LOWER (), MID ()/SUBSTRING ()/SUBSTR (), LENGTH (), LEFT (), RIGHT (), INSTR (), LTRIM (), RTRIM (), TRIM ().
Date Functions: NOW (), DATE (), MONTH (), MONTHNAME (), YEAR (), DAY (), DAYNAME (). Aggregate Functions: MAX (), MIN (), AVG (), SUM (), COUNT (); using COUNT (*).
Querying and manipulating data using Group by, Having, Order by.

Unit 3: Introduction to Computer Networks

Introduction to networks, Types of network: LAN, MAN, WAN. Network Devices: modem, hub, switch, repeater, router, gateway Network Topologies: Star, Bus, Tree, Mesh.
Introduction to Internet, URL, WWW, and its applications- Web, email, Chat, VoIP.
Website: Introduction, difference between a website and webpage, static vs dynamic web page, web server and hosting of a website.
Web Browsers: Introduction, commonly used browsers, browser settings, add-ons and plug-ins, cookies.

Unit 4: Societal Impacts
Digital footprint, net and communication etiquettes, data protection, intellectual property rights (IPR), plagiarism, licensing and copyright, free and open source software (FOSS), cybercrime and cyber laws, hacking, phishing, cyber bullying, overview of Indian IT Act.
E-waste: hazards and management.
Awareness about health concerns related to the usage of technology.