CHEMISTRY.

XII STD : *INDEX*

A- THEORY

UNIT NO	TITLE	Suggested No. of Periods
	Inorganic Chemistry	
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VI	Co-ordination compounds & bio co-ordination compounds	5
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IX	Thermodynamics II	6
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XV	Isomerism in Organic Chemistry	5
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Total No. of Periods		**140**

B- PRACTICAL
(As Found in the Syllabus)

UNIT -I. Atomic Structure -II

EXPECTED SPECIFIC OUTCOME OF LEARNING	CONTENT IN TERMS OF CONCEPTS	CURRICULUM TRANSACTIONAL STRATEGIES	ILLUSTRATIONS	EVALUATION	SUGGESTED NO. OF PERIODS
Recognises the dual properties of electron.	1.1 Dual properties of electrons	Particle and wave properties of electron is impressed.	Tabulate the name of experiments to prove particles and wave property of electrons.	Mention the methods to prove the properties of electron.	
Understands the de-Broglie relation.	1.2 de-Broglie relation.	de-Broglie relation ? =h/mv. Significance and problems.	Impresses dual properties of electrons.	Given the speed of light as $3.0x10^{8}$ m/s and the electron mass as $9.1x10^{28}$ g. Calculate the de-Broglie wave length for an electron travelling at 1% the speed of rate	
Recognises Heirsenberg's Uncertainity principle	1.3 Heisenberg's uncertainity principle	Principle underlying Heisenberg's uncertainity principle.	Uncertainity in position and velocity is explained	State and explain Heisenberg's uncertainity principle.	
Proposes wave nature of an electron.	1.4 wave nature of an electron.	Mathematical equations used to describe wave motion of an electron is explained.	Electron wave principle – moving or running wave.	Explain wave nature of an electron	
Introduces schrodinger wave equation.	1.5 Schrodinger wave equation .(only equation, no derivation)	Parameters in schrodinger wave equation is explained.	Application of schrodinger wave equation to find out symmetry and shape of orbitals.	Write schrodinger wave equation and explain principle involved in it.	
Learns eigen values and eigen functions.	1.6 Eigen values and Eigen function-significant only.	Only significances of eigen values and eigen functions are impressed.	Applications of Eigen value and Eigen function	Write briefly on meaning and significance of Eigen values and Eigen function	
Proposes molecular orbitals	1.7 molecular orbital method. Application to homo diatomic and Hetero diatomic molecules.	Indicate bonding and anti bonding. Molecular orbitals and their relative energies	M.O Diagram for Hydrogen molecules, Nitrogen molecules Oxygen molecules, and NO molecules	Construct M.O diagram for Oxygen molecule and indicate whether it is para or dia-magnetic. And bondorder.	
Introduces metallic bonding	1.8 Metallic Bond	Simple theories Drude and Band theory -Elementary Treatment	Application of Band theory	Write briefly on band theory of metals.	

Analyses Hybridisation	1.9 Hybridization of atomic orbitals	Hybridization involving s,p, and d Orbitals.	Sp^3 ,dsp^2, d^2 sp^3, hybridization and their corresponding shapes.	Indicate the shape of the molecules formed through dsp^2 and d^2sp^3 hybridization.	
Recognises the types of forces between molecules.	1.10 Types of forces between molecules.	Vanderwalls force, dipole –dipole interactions, Hydrogen bond.	Weak forces of attraction between molecules are impressed	Metion different types of forces exist between molecules?	
Unit – II. Periodic classification-II					
Recalls the periodic properties	2.1 Review of periodic properties.	Trends in various periodic properties are impressed.			
Learns calculation of atomic radii, ionic radii.	2..2 Calculation atomic radii.	Calculation of atomic radii from covalent bond length.	Specific examples of bond length.	How is atomic radii calculated from covalent bond length?	
	2.2.1Calculation of ionic radii	Ionic radii from Pauling and Slatter's rule is explained.	Specific examples of calculating cationic and anionic radii.	How ionic radii is calculated from effective nuclear charge and screening constant?	
Analyses ionisation potential and the method to determine IE and the factors affecting IE.	2.3 Method of determination of Ionisation potential.	Mention the name of the method for the calculation of IE.	Differentiate I, II and III ionisation potential.	Why III IE is far greater than II. IE?	
	2.3.1 Factors affecting ionisation potential	Effect of nuclear charge, atomic radii and screening effect upon ionisation energy.	Explain the concept with specific examples.	Why IE decreases down the group?	
Understands the method to determine electron affinity and the factors affecting them.	2.4 Method to determine the electron affinity 2.4.1 Factors affecting EA.	Mention the name of the method only Effect of nuclear charge, atomic radii and screening effect upon EA.	Among the elements in the periodic table, elements having highest EA and lowest EA. Explanation through specific examples	Explain the various factors affecting that affects electron affinity?	
Analyses the various scales	2.5 Various scales on	Pauling and mullikan's scales	Sample calculations	How electro negativity values help to find out	

on electro negativity.	electro negativity values.	are briefly explained.	through simple relations.	nature of bonding between atoms?	
UNIT III p - BLOCK ELEMENTS - II					
Recognises the general trends	3.1 Group -13 General trends	Brief idea about trends in various physical properties	Tabulate various properties		
Understands the preparation, properties and uses of potash alum	3.1.1 Potash alum- Preparation, Properties uses	Any one method of preparation, chemical properties and uses	Preparation, properties are explained through equations	How potash alum is prepared? Mention its uses.	
Recognises the general trends	3.2 Group 14 General trends	Brief idea about trends in various properties	Tabulate various properties		
Learns silicates	3.2.1 Silicates - Types and structure	Various types of silicates and related structures are explained	Explanation through specific examples	Give an example of two dimensional and three dimensional silicates?	
Recognises the structures and uses of silicones	3.2.2 Silicones - Structure and uses	Explains - different types of silicones and their corresponding structures.	Importance of silicones in day today life.	What are silicones? Mention their important uses?	
Understands the extraction of lead	3.2.3 Extraction of lead	Method of extraction of lead from its sulphide ore is explained. The role of lead in industries, plumbo solvency is explained	Flow chart of metallurgy of lead.	How is very pure lead extracted from its sulphide ore?	
Recalls the general trends.	3.3 Group - 15. General trends	Brief idea about trends in various properties	Tabulates various properties		
Knowledge about allotropy and the extraction of phosphorous	3.3.1 Phosphorous - Allotropes and extraction	Explain various allotropes of phosphorous and compare their properties	Importance of phosphorous in industry	Explain different allotropes of phosphorous.	
Recognises the compounds of phosphorous.	3.3.2 Compounds of phosphorous	Halides, oxides, oxyacids and hydride of phosphorous - preparation, properties, uses and structure is explained.	Explains preparation and properties through equations and structures through diagrams.	How are P_2O_3, P_2O_5 prepared from phosphorous? Mention their important properties.	
Recalls the general ideas.	3.4 Group - 16. General trends	Brief idea about trends in various properties.	Tabulate various properties.		

Understands the manufacture and properties of H_2SO_4.	3.4.1 H_2SO_4 - Manufacture and properties.	General outline of manufacture of H_2SO_4 and its reactions with metals and non-metals.	Explains property through equations	How is H_2SO_4 manufactured ?	
Understands general characteristics and properties	3.5 Group - 17 General characteristics. Physical and Chemical properties	Trends in general electronic configuration, oxidation power of halogens, anamolous nature of fluorine, nature and solubility of halides in water, different oxidation states of halides	Explains through equations	Discuss in detail the general characteristics of halogens.	
Recognises the isolation of fluorine and its properties.	3.5.1 Isolation of fluorine and its properties	Electrolysis of flourides to produce fluorine, itching property of fluorine.	Properties of fluorine through equations.	How fluorine is isolated from their fluorides? Mention the itching property.	
Understands about inter halogen compounds	3.5.2 Interhalogen compounds	Preparation, properties and structure are explained.	Properties through equations. Structure through diagrams	What are interhalogen compounds? How are they prepared.	
Recognises the importance of inert gases.	3.6 Group-18 Inert gases - Isolation, properties and uses	Isolation of inert gases from air, preparation, properties of compounds of xenon	Flow chart - Isolation of inert gases. Importance of noble gases in industry.	Describe in detail how noble gases are isolated from air.	
UNIT IV d - BLOCK ELEMENTS					
Proposes the general characteristics of d-block elements	4.1 General characteristics of d-block elements	Nature of four transition series, electronic configuration atomic and ionic radii, metallic character, coloured ion formation, catalytic properties, complex formation, magnetic properties, formation of alloys, oxidation number and variable valency.	Tabulate the physical properties and general characteristics.	How many transition series are there in d-block elements? Explain their general characteristics.	
Understands the extraction of	4.2 First transition series				

the extraction of chromium, copper and zinc.	4.2.1 Occurrence and principles of extraction - chromium, copper and zinc - Alloys.	General methods of extraction, purification and properties. Name and uses of alloys.	Explain reactions through equations. Metallurgy through flow chart. Table of characteristics of alloys.	How is very pure chromium extracted from its oxide ores? Mention any two alloys of chromium and their uses.	
Recognises the extration of silver	4.3 Second transition series				
	4.3.1 Occurrence and principles of extraction of silver	General methods of extraction and purification of silver from its ore and properties. Spitting of Silver. Extraction of silver from silver coins.	Explain reactions through equations. Metallurgy through flowchart.	How is silver extracted from its sulphide ore? Write a note on spitting of silver.	
Proposes the extraction of gold.	4.4 Third transition series				
		General methods of extraction of gold from gold bearing rocks. Gold plating, properties of gold, reactions with aqua regia.	Explain metallurgy through flow chart and properties through equations	How is gold extracted from gold bearing rocks?	
Recognises the importance of compounds of transition metal.	4.5 Compounds - $K_2Cr_2O_7$, $CuSO_45H_2O$, $AgNO_3$, Hq_2Cl_2, $ZnCO_3$, Purple of cassius.	Methods of preparation, properties and uses	Explain preparation and properties through equations.	How is $K_2Cr_2O_7$ prepared from the chrome iron ore?	
UNIT - V f-block elements					
Learns the general characteristics of f-block elements & extraction.	5.1 General characteristics of f-block elements and extraction.	Electronic configuration, oxidation state, ionic radii of trivalent lanthanide ions Extraction from monozite.	Tabulate general characteristics of f-block elements. Give a flowchart.	Describe in detail general characteristics of f-block elements. Give an account on lanthanide contraction and its consequences.	
Proposes the comparision of lanthanides and actinides	5.2 Comparison of Lanthanides and Actinides.	Comparison of properties of Lanthanides and Actinides.	Tabulate the comparison of lanthanides and actinides.	Compare the properties of lanthanides and actinides.	
Recognises the uses of lanthanides and actinides.	5.3 Uses of lanthanides and actinides	Uses of lanthanides and actinides are emphasised.	Tabulate the uses of lanthanides and actinides.	Mention any three uses of lanthanides and actninides.	

UNIT – VI COORDINATION COMPOUNDS AND BIO-COORDINATION COMPOUNDS

Learns coordination compounds	6.1 An introduction	Explanation of simple salts, double salts and complex salts.	Representation of salts through chemical formula	Give one example each for double salt and complex salt? In what way complex salt differs from double salt?	
Proposes the terminology in co-ordination chemistry	6.2 Terminology in coordination chemistry	Defines and explains ligands, central metal ion, coordination number, charge on complex ion, oxidation state of central metal ion, chelates	Explains the different types of ligands including chelating legand.	What are ligands and coordination number?	
Proposes IUPAC nomenclature of coordination compounds	6.3 IUPAC nomenclature of mononuclear coordination compounds	Latest nomenclature of coordination compounds by emphasising alphabetical order.	Naming cationic complex, anionic complex and neutral complex.	Give the formula of the following complex compounds. 1.Potassium hexacyano ferrate(II) 2.Tetramminecopper(II) sulphate	
Recognises isomerism in coordination compounds	6.4 Isomerism in coordination compounds	Importance of isomerism is explained			
Proposes structural isomerism	6.4.1 Structural isomerism	Gives specific examples with formulae	Chart showing different structural isomers	Find the type of isomerism in the following compounds [$Fe(NH_3)_2\ Cl_2]NO_3$	
Learns geometrical isomerism in coordination compounds	6.4.2 Geometrical isomerism in 4 - coordinate, 6 – coordinate complexes	Any two specific examples	Diagrammatic representation of Geometrical isomerism.	Write structure for cis and trans diammine dichloroplatinum(II)	
Recognises the theories of coordination compounds	6.5 Theories on coordination compounds				
	6.5.1 Werner's theory (brief)	Brief concept of Werner's theory		Write briefly on Werner's theory of coordination compounds.	
	6.5.2 Valence Bond theory	Postulates with one para	Orbital diagrammatic	Using VB theory prove $[FeF_6]^{4-}$ is	

		magnetic and one diamagnetic complexes	representation Explains shape and magnetic properties.	para magnetic whereas $[Fe(CN)_6)]^{4-}$ is diamagnetic. Predict their shapes.	
	6.5.3 Crystal field theory	Brief concept of crystal field theory	Proposes only elementary idea	Compare VB theory and crystal field theories	
Analyses the importance of the coordination compounds	6.6 Uses of coordination compounds	Role of coordination compounds in analysis is explained.	Importance of coordination compounds	Mention the uses of coordination compounds	
Learns about Bio coordination compounds	6.7 Bio-coordination compounds Haemoglobin and chlorophyll	Brief explanation of haemoglobin and chlorophyll mentioning the central metal ion and ligand system.	Role of Haemoglobin and chlorophyll - tabulated.	Mention the central metal ion and ligands present in haemoglobin and in chlorophyll.	

UNIT -VII. Nuclear chemistry

Proposes about Nuclear chemistry	7 Nuclear chemistry	Brief explanation of nuclear reactions.			
Learns nuclear fission and fusion	7.1 nuclear energy nuclear fission and fusion	Brief explanation of nuclear fission and its application to nuclear power generation fusion reaction	Diagrammatic representation of nuclear reactions	Write briefly on nuclear fission and nuclear fusion.	
Recognises radio carbon dating	7.2 Radio carbon dating	Brief explanation of the method	Write simple representation through skeleton equation	Write briefly on radio carbon dating.	
Knowledge about sun	7.3 Nuclear reaction in sun	Mention the types of nuclear reactions taking place in sun.	Tabulate the reactions.	Mention the types of reactions take place in sun.	
Recognises the uses	7.4 uses of radioactive isotopes	Explains the application in medicine, industry and in analyses	Tabulate the uses	Mention the uses of radioactive isotopes	

UNIT -VIII. Solid state II

Learns the packing of atoms in crystals.	8.1 Types of packing in crystals.	bcc, fcc arrangements	Diagrammatic representation of bcc & fcc arrangements	Explain different types of packing of atoms in crystals.	
Analyses the X-Ray crystal structure.	8.2 X-Ray crystal structure.	Bragg's equation(no derivation) Brief explanation of the method	Explain the significance of Bragg's equation and the Bragg's method	Write briefly on Bragg's method of determining crystal structure	
Recognises the types of crystals	8.3 types of ionic crystals	AB and AB_2 types with simple explanation	Significance of AB and AB_2 types	Give examples of crystals which follow AB and AB_2 types	
Learns the imperfection in solids	8.4 Imperfections in solids	Schotky, Frenkel defects – elementary idea.	Diagrammatic representation	Explain different imperfections	
Proposes the properties of crystals	8.5 Properties of crystalline solids	Elementary idea about conducting and super conducting properties.	Table showing the difference between conducting and super conducting properties.	Differentiate conducting and super conducting materials.	
Learns amorphous soilds	8.6 Amorphous soild	Glasses – properties super cooled liquids	Nature of glassy substances	Explain the nature of glass.	

Unit – IX THERMODYNAMICS - II

Recalls I law of thermodynamics	9.1 Review of I law	Limitation of I law of thermodynamics		State limitations of I law of thermodynamics	
Proposes II law of thermodynamic	9.2 Need for the II law of thermodynamics	Various statements of II law of thermodynamics	Mathematical representation of statements.	State II law of thermodynamics in different ways.	
Recognises spontaneous and non-spontaneous processes	9.3 Spontaneous and non spontaneous processes	Brief explanation with examples.	Mathematical representation of entropy changes for spontaneous and non spontaneous processes.	How would you differentiate spontaneous and non spontaneous processes through entropy changes.	

Learn about entropy, Gibb's free energy	9.4 Entropy 9.5 Gibb's free energy	Brief explanation Nature and tool to find out the spontaneity of a process.	Relate ? G=? H-T? S	At $25^{O}C$? S=+105 $jkmol^{-1}$ write the free energy change of the reaction. Predict spontaneity (or) non spontaneity.	
	9.5.1 Free energy change and chemical equilibrium	Equations only significance of the equations	Condition for equilibrium ? G = O		
Understands the concept of third law of thermodynamics.	9.6 Third law of thermodynamics	Elementary idea of third law and impact on third law of entropy	Introduce the concept of third law through entropy concept.	State and explain third law of thermodynamics.	

UNIT –X Chemical equilibrium II

EXPECTED SPECIFIC OUTCOME OF LEARNING	CONTENT IN TERMS OF CONCEPTS	CURRICULUM TRANSACTIONAL STRATEGIES	ILLUSTRATIONS	EVALUATION	SUGGESTED NO. OF PERIODS
Recalls law of mass action.	10.1 Applications of law of mass action.	1) ? n_g = 0 2) ? n_g = +ve 3) ? n_g = -ve	Derivations of Kp and Kc for the following reactions 1)Formation of HI from H_2 and I_2 2)Decomposition of PCl_5 3) Formation of NH_3 from N_2 and H_2	Derive Kp and Kc for the formation of ammonia by Haber's Process.	
Learns Le Chatlier's Principle.	10.2 Le Chatlier's principle.	Applications of Le Chatlier's principle to Haber's process and contact process and Birkeland-Eyde process.	Explain the effect of change of temperature and change of pressure on equilibrium. Quantitative calculations on chemical equlibrium.	Apply Le Chatlier's principle for higher yield of nitric acid through Birkeland-Eyde process. 1 mole of nitrogen and 3 moles of hydrogen, were mixed at 593 K and $2X10^{7}$ Pa. At equilibrium the mixture contained 1.5	

				moles of ammonia. Calculate Kp for this reaction.	

Unit – XI Chemical Kinetics -II

Recalls order of the reactions	11.1 First order reaction and pseudo first order reaction	Derivation of rate constant of first order reaction and half - life period.	Impress the unit of rate constant order of reactions.	Derive the rate constant of first order reaction and derive the suitable unit.	
Knowledge about the experimental determination of first order	11.2 Experimental determination of first order reaction.	Acid hydrolysis of an ester	Impress pseudo first order reactions.	How is the rate constant of acid hydroysis of ester determined?	
Learns the methods of determining order of the reaction.	11.3 method of determining order of reaction	Graphical method	Show the nature of curve connecting the rate Vs concentraions and rate Vs $Concn^2$, rate Vs $Concn^3$	How will you differentiate orders of chemical reaction through graphical method?	
Analyses temperature effect on rate constant.	11.4 temperature dependence of rate constant	Arrhenius equation (no derivation) and the brief significance of Arrhenius parameters	Significance of activation energy through graphical representation	Explain the various parameters found in Arrhenius equation?	
Learns simple and complex reactions.	11.5 Simple and complex reactions	Examples with brief explanation.	Show the reaction path.	Differentiate simple and complex reactions.	

UNIT XII – SURFACE CHEMISTRY

Learns Adsorption	12.1 Adsorption	Physical and chemical adsorptions. Factors affecting adsorption.	Tabulate the differences between physical and chemical adsorption.	Differentiate physical and chemical adsorption.	
Recognises the importance of catalysis	12.2 Catalysis	Homogeneous and heterogeneous catalysis and types of catalysts.	Examples for all types of catalysts.	Write briefly on i)Promoters ii)Active centers iii)Catalytic poisons.	
Understands the theory of catalysis	12.3 Theory of catalysis	Heterogeneous catalysis and intermediate	Represent theories through equation.	Explain intermediate compound	

		compound theory.		theory.	
Learns colloids and their types, preparation and properties.	12.4 Colloids 12.5 Preparation of colloids 12.6 Properties of colloids	Nature, types Dispersion and condensation methods Kinetic, optical and electrical properties	Tabulate the types Explain different dispersion and condensation methods Explain with diagrams	1.How colloids are prepared by condensation method ? 2. Write briefly on Tyndall effect, Brownian movement and catephoresis.	
Understands about emulsions	12.7 Emulsions	Oil in water and water in oil emulsions	Explanation with examples	What are emulsions? Give examples.	

UNIT XIII – ELECTROCHEMISTRY – I

Learns conductors, insulators and semi conductors	13.1 Conductors, insulators and semi conductors	Nature and type with examples	Tabulate the differences between three types of conductors	What are semi conductors?	
Recognises theory of electrical conductance	13.2 Theory of electrical conductance	Brief idea about Arrhenius theory of electrolytic conductance and its limitations	Applicability of Arrhenius theory to weak electrolyte is emphasized.	What are the limitations of Arrhenius theory of electrolytic dissociation?	
Learns theory of electrolytes	13.3 Theory of strong electrolytes	Brief idea about interionic theory	Explain various retardation effects. Mention Onsager equation.	Explain the various retardation effects present during the migration of ions in solution.	
Recognises the Faraday's laws of electrolysis.	13.4 Faraday's laws of electrolysis.	Statement of laws and their significance	Quantitative calculations on Faraday's laws	State and explain Faraday's laws of electrolysis.	

Applies knowledge on conductance	13.5 Specific resistance, specific conductance, equivalent and molar conductance.	Definition and explanation	Explanation through mathematical explanation.	Define specific, equivalent and molar conductance.	
Analysis the effect of dilution on conductance.	13.6 Variation of conductance with dilution	Nature of variation of strong and weak electrolytic solutions	Graphical representations of conductance Vs concentration.	Indicates the types of curves obtained for strong and weak-electrolyte.	
Recognises the law	13.7 Kohlrausih's law	Statement and significance	Explanation through examples	State and explain Kohlrausih's law?	
Learns the concept of ionic product of water, p^H and p^{OH}.	13.8 Ionic product of water, p^H and p^{OH}	Definition, explanation	Quantitative calculations on Ionic product, p^H and p^{OH}.	Calculate p^H and p^{OH} of 0.1m HCl.	
Understands buffer solutions	13.9 Buffer solutions	Nature, Explanation Henderson equation Importance of buffer solution in domestic and in industry.	Nature of acidic, basic buffer.	Derive Henderson equation for acid buffer.	
Recognises the uses of p^H values	13.10 Use of p^H values	p^H scale- p^H range of indicators in titrations.	Nature of p^H range for different types of titrations.	How indicators are chosen for acid, base titrations.	

UNIT XIV – ELECTROCHEMISTRY - II

Understands cells	14.1 Cells	Electrolytic and Electrochemical cells	Interconversion of electrical and chemical energy is emphasized.	Explain electrolytic and electrochemical cell with suitable examples.	

Proposes electrodes and electrode potentials	14.2 Electrodes and electrode potentials	Metal-Metal ion electrode and hydrogen electrode – calculation of electrode potential from Nernst equations	Impress relation between ? G = -nEF occurring in cells	Explain relationship between change of free energy and electrode potentials.	
Learns the construction of cells using electrodes	14.3 Construction of cell and EMF	Using standard electrodes the method of constructing a cell	Construction of Daniel cell – cell EMF from electrodes potentials	Represent the emf of Daniel cell from electrode potential	
Recalls corrosion and its preventions	14.4 corrosion and its preventions	Electrochemical corrosion and the concept	Electrochemical relations involved in corrosion	Explain electro chemical corrosion	
Applies knowledge of electrochemistry	14.5 commercial production of chemicals	Production of NaOH, Extraction Al, Na and Cl_2.	Only principles (not the detailed procedures)	Mention the principle in electrolytic preparation of Na from NaOH ?	
Realises the importance of fuel cells	14.6 Fuel cells	Primary, Secondary including fuel cells	Importance of primary, secondary and fuel cells	Write briefly on fuel cells.	

UNIT XV – ISOMERISM IN ORGANIC CHEMISTRY

Learns geometrical isomerism	15.1 Geometrical isomerism.	Geometrical or Cis-trans isomerism in alkenes.	Explain the meaning of cis-trans isomerism with examples	Draw the structures of cis and trans isomers of 1,2-dibromoethene and 2,3-butadiene.	
Recognises conformation of cyclic compounds	15.2 Conformations of cyclic compounds	Discuss the conformation in cyclohexanol.		Drwa the structures of different conformers of cyclohexanol.	
	15.3 Optical isomerism	Explain the meaning of the terms asymmetric carbon, enantiomers, racemic mixture, chirelity	Represent asymmetric nature of carbon in optically active compounds	Explain the terms: Asymmetric carbon, enantiomers, racemic mixture	

Learn optical activity	15.3.1 Optical activity	Explain the phenomenon of optical activity and conditions for optical activity.	Give examples of compounds showing optical activity	What are the conditions for optical activity.	
Proposes chivality	15.3.2 Chirality	Concept of chirality is explained.	Chirality-Nature and meaning	What is meant by chiral carbon.	
Identifies the chiral centres in compounds	15.3.3 Compounds containing chiral centres	Give examples of compounds containing chiral centre.	Diagrammatic representation of optical isomers of lactic acid (one chiral centre) and tartanic acids.(two chiral centres)	Give the optical isomers of lactic and tartaric acid.	
Recognises the D-L and R-S notation of optical isomers.	15.3.4 D-L and R-S notation.	D-L and R-S notation of optical isomers – elementry idea is given.	Representation of D-L and R-S notations through diagram.	Identify each of the following structures as R or S CH_3 CH_3 I-C-H H-C-Cl Br CBr3	
Recognises the isomerism in distributed benzene1	15.4 Isomerism in distributed benzene	Nature of O,P and m-isomers of distributed benzene is explained.	Represents the isomers in the term of equations		

UNIT XVI – HYDROXY DERIVATIVES

Learns the naming of alcohols	16.1 Nomenclature of alcohols	IUPAC names of first few members of alcohol series	Table showing structural formula IUPAC name and common names of first few members of the series.	Write the structure of the following compounds 3-Hexanol 2,3-Dimethyl-2-butanol	
Learns the classification of alcohols	16.2 Classification of alcohols	Classification of alcohols – Monohydric, dihydric and polyhydric alcohols.Primary, secondary and teritiary alcohols.	Give examples for each type of alcohols.	Give one example each for 1^0,2^0 and 3^0 alcohols.	

Learns the general methods of preparation, properties and uses of alcohols.	16.3 General methods of preparation of primary alcohols	Mention the preparation of alcohols from alkenes, alkylhalides, aldehydes, Grignard reagents, primary amines.	Represent the reactions with chemical equations	How will you obtain ethylalcohol using grignard reagents.	
	16.3.1 Properties	Mention inportant physical properties - chemical properties - Reaction with metals, phosphorous halides, thionyl chloride, hydrogen halide, carboxylic acid, acid halides and anhydrides	Represent the reactions with chemical equations	Complete the following i)$C_2H_5OH + Na$ ✍ ii)$ROH + PCl_5$ ✍ iii)$C_2H_5OH + SOCl_2$ ✍	
Distinguishes 1^0, 2^0 and 3^0 alcohols.	16.3.2 Methods of distinction between three classes of alcohols (1^0,2^0 and 3^0)	16.3.2 Explain the methods of distinction - Lucas test, oxidation test, catalytic dehydrogenatio n and Victor Meyer's test.	Give suitable chemical equations	How will you distinguish 1^0, 2^0 and 3^0 alcohols ?	
Learns the methods of preparation, properties and uses of dihydric alcohols.	16.4 Methods of preparation of dihydric alcohols.(glyco l).	Explain the preparation of ethylene glycol .	Represent the reactions with chemical equations.	How will you prepare ethylene glycol from i)ethylene oxide ii)ethylene diamine.	
	16.4.1 Properties	Mention the physical properties. Chemical properties- reaction with Na, PCl_5,HCl, Carboxylic acid, HNO_3 terephthalic acid, action of heat and oxidation.	Represent the chemical reactions with equations	How will you convert ethylene glycol into i)glycol nitrate ii)terylene iii)oxalic acid.	

	16.4.2 Uses	Mention the uses of glycol.			
Learns the methods of preparation, properties and uses of trihydric alcohols.	16.5 Methods of preparation of trihydric alcohols.	Synthesis from esters of fatty acids and propene.	Give the chemical equations of the reactions.	How will you prepare glycol from propene.	
	16.5.1 Properties	Mention the physical properties. The chemical properties – Reaction with Na, HCl, PCl5, acetic acid, nitric acid, oxalic acid, HI, dehydration and oxidation.	Represent the reactions with chemical equations.	Give the chemical equations for the conversion of glycol into i)glycol trinitrate ii)acrolein iii)allyl alcohol	
	16.5.2 Uses	Give the uses of glycol.			
Understands the methods of preparation of properties and uses of benzyl alcohol.	16.6. Aromatic alcohols.				
	16.6.1 Methods of preparation of benzyl alcohol.	Preparation from benzyl chloride and benaldehyde and bycannizaro reaction.	Give suitable chemical equations	Describe the preparation of glycol by Cannizzarro's reaction.	
	16.6.2 Properties	Physical properties Chemical properties – Reaction due to primary alcoholic group and benzene ring.	Represent the reactions with chemical equations.		
	16.6.3 Uses	Use in cosmetics and in medical field.			
Understands the classification of phenols.	16.7 Phenols.	Classification into monohydric, dihydric and trihydric phenols.	Draw the structures of different types of phenols.		

	16.7.1 Manufacture of phenols	Manufacture of phenol from chlorobenzene, diazonium salt and benzene.	Give suitable chemical reactions	How phenol is synthesized from Benzene diazonium chloride.	
	16.7.2 Properties	Physical properties Acidic nature of phenol.	Explain the acedic nature of phenol.	Why phenol is more acidic then alcohols.	
	16.7.3 Chemical properties	Reactions of hydroxyl group and benzene ring are explained.(All name-reaction)	Represent with suitable chemical equations.	Write notes on Reimer-Tiemann reaction, Kolbe reaction and coupling reaction of phenols	
	16.7.4 Uses of Phenols	Industrial and domestic uses			

UNIT – XVII ETHERS

Recognises classification, nomenclature and isomerism in ethers	17.1 Ethers	Classification, nomenclature and isomerism in ethers are explained with examples		Mention the types of isomerism found in ehters	
Learns the general methods of preparation, properties and uses of aliphatic ethers	17.2 General methods of preparation of aliphatic ethers	Dehydration of alcohols, Williamson's synthesis using Grignard reagents and from alkyl halides.	Represent the reactions with chemical equations.	How will you obtain diethyl ether by Williamson's synthesis.	
	17.2.1 Properties	Physical properties, chemical properties – Reaction with Cl_2, Pcl_5, H_2SO_4, HI and formation of peroxide and oxonium salts	Give suitable chemical equations	Give two types of reactions of Cl_2 with diethyl ether.	

	17.2.2 Uses	Mention its use as solvent, anaesthetic, substitute for petrol etc.		Give any two uses of ethers?	
Understands the preparation, properties and uses of anisole.	17.3 Aromatic ethers	Mention important aromatic ethers – anisole, phenotole		Give the IUPAC name of anisole.	
	17.3.1 Preparation of anisole	Give the preparation of anisole by Williamson's synthesis.	Give the chemical equations	Write the synthesis of anisole.	
	17.3.2 Reactions of anisole	Reaction with Cl_2, HI & nitration.		Complete the reaction Anisole + Br_2/H_2O ✍ ?	
	17.3.3 Uses	Mention its uses.			

UNIT – XVIII Carbonyl Compounds.

Understands nomenclature of carbonyl compounds.	18.1 Nomenclature of carbonyl compounds.	Nomenclature of aldehydes and ketones of lower members.		Write the structures of the following 3-hydroxybutanal 3- pentanone	
Recognises similarities and differences between aldehydes and ketones	18.2 Comparison of aldehydes and ketones.	Compare aldehydes and ketones with corresponding reactions.	Table showing the Comparison of aldehydes and ketones.		
Learns general methods of preparation of aldehydes, properties and uses.	18.3 General methods of preparation of aldehydes	Preparation from alcohols, alkenes, acid chlorides acetylene, and calcium salt of fatty acid.	Give suitable chemical reactions.	Explain the preparation of acetaldehyde from ethanol, and acetylene.	

	18.3.1 properties	Physical properties Chemical properties - nucleophilic addition reactions with $NaHSO_3$, HCN, ammonia derivatives , Grignard reagents, reduction and oxidation reactions, Schiff's test, reaction with NaOH, Cl_2 haloform reaction and polymerisation reaction.	Represent the reactions with suitable chemical equations.	Complete the following 1) $HCHO + NH_3$ ✍ 2) $CH_3CHO+NH_2NH_2$ ✍ 3) $CH_3CHO+OH^-+Cu^{2+}$ ✍	
	18.3.2 Uses	Mention the commercial and synthetic uses of formaldehyde and acetaldehyde		Mention the uses of formaldehyde and acetaldehyde	
Learns aromatic aldehydes -preparation and properties	18.4 Aromatic aldehydes	Formulae and names of inportant aromatic aldehydes			
	18.5 Preparation of benzaldehyde.	Preparation by oxidation, hydrohysis and from calcium salt of fatty acids.	Represent with chemical equations.	How will you obtain benzaldehyde from benzal chloride?	

	18.5.1 Properties	Physical properties Chemical properties reactions similar to aliphatic aldehydes and reactions different from aliphatic aldehydes – nucleophilic substitution reactions and naming reactions.	Represent the reactions with chemical equations.	Writre note on 1) Cannizzaro reaction 2) Benzoin condensation 3) Perkin's reaction 4) Claisen reaction	
	18.5.2 Uses	Mention the uses of benzaldehyde			
Learns about aliphatic and aromatic ketones	18.6 Ketones	Classification ketones	Classifies as aliphatic, mixed and aromatic ketones	Write the structure of arisole, benzophenone	
	18.7 general methods of preparation of aliphatic ketones (acetone)	Give the preparation of acetone from isopropyl alcohol, calcium salt of fatty acids and hydrolyses of isopropylidene chloride.	Represents equations for all the synthetic methods	How acetone is obtained from isopropylalcohol and calcium salt of fatty acids.	
	18.7.1 Properties	Physical properties Chemical properties Reactions common to both aldehydes and ketones reactions different from aldehyde.	Mention common Physical properties Give suitable Chemical equations.	In what way aldehydes differ from ketones?	
	18.7.2 Uses	Mention the uses of acetone.		Mention the uses of acetone	

	18.8 Aromatic ketones	Formulae and IUPAC names of acetophenone and benzophenone.			
	18.8.1 preparation of acetophenone	Preparation by Friedel –Craft's reaction and calcium salts.	Give the chemical equation	Describe any two methods of preparation of acetophnone.	
	18.8.2 Properties	Physical properties Chemical properties Reduction, oxidation halogenation, electrophilic substitution and haloform reaction.	Represent with suitable chemical equations	What happens when acetophenone reaction with chlorine in presence of halogen carried?	
	18.8.3 Uses	Mention the uses of acetophenone.	List the uses.	Mention any two uses of a acetophenone	
	18.9 preparation of benzophenone .	By Friedel-Craft's reaction, and distillation of calcium benzoate .	Represent preparation through equation .	How benzophenone is prepared from benzene	
	18.9.1Properties	Physical properties Chemical properties Oxidation, reduction, fusion with solid KOH		Mention oxidation properties of benzophenone	

UNIT XIX – CARBOXYLIC ACIDS

Recalls the nomenclature of carboxylic acids	19.1 Nomenclature	Nomenclature of carboxylic acids	Tabulates the IUPAC and common names and structure of lower members of the series		

Understands the preparation, properties of formic acid.	19.2 Preparation of aliphatic monocarboxylic acids – formic acid.	Oxidation of methanal, hydrolysis of HCN and from oxalic acid.	Explains the preparation with suitable chemical equations	How will you prepare formic acid from HCN.	
$\xrightarrow{\Delta}$	19.2.1 Properties	Physical properties	Mention the characteristic physical properties. Explains the important chemical reactions with equations.	Complete the following i)$HCOOH+PCl_5$ ✍ ii)$HCOOH+NH_3$ ✍ iii)$HCOOH+Ag_2O$ ✍ iv)HCOOH	
Recognises the uses of formic acid	19.2.2 Uses	Mention the industrial uses			
Learnsto test the presence of carboxylic acid group	19.2.3 Tests for carboxylic acid	Litmus test, reaction with $NaHCO_3$ and alcohol.	Illustration by doing experiments.		
Recalls the functional group, formula and nomenclature Recalls the natural sources of lactic acid Learns the synthesis of lactic acid.	19.3 Monohydroxy monocarboxylic acids.	Give examples.			
	19.3.1 Lactic acid – Sources	Give the natural sources of lactic acid.			
	19.3.2 Synthesis of lactic acid	Synthesis from acetaldehyde, molasses and ? -substituted propionic acid.	Give suitable chemical equations	How will you prepare lactic acdi from ? -chloropropionic acid ?	
	19.4 Aliphatic dicarboxylic acids	Mention the lower members			

Learns the preparation of dicarboxylic acids.	19.4.1. preparation of dicarboxylic acids – oxalic and succinic acids	Preparation of oxalic acid from sucrose, cyanogens and glycol. Preparation of succinic acid from ethylene cyanide and ethylene.	Explains with chemical equations.	Give the preparation of oxalic acid and succinic acid.	
Learns the properties of dicarboxylic acids.	19.4.2 Properties	Physical properties Chemical properties-	Explains the chemical reactions with equations.	Give the reactions of oxalic acid and succinic acid with i)NaOH ii)PCl_5 iii)NH_3 iv)action of heat	
Recognises the strength of carboxylic acid	19.5 Strengths of carboxylic acids.	Resonance effect	Draw the resonance structure of carboxylic acid and carboxylic ion.	Formic acid is stronger than acetic acid. Explain	
	19.6 Aromatic acids	Mention important acids			
Learns the methods of preparation of benzoic acid.	19.6.1 Preparation of benzoic acid.	Gives the methods of preparation of benzoic acid.	Represent with suitable chemical equations.	How will you prepare benzoic acid from the following ? i)benaldehyde ii)toluene iii)phenyl cyanide iv)phenyl magnesium bromide	
Understands the properties of benzoic acid.	19.6.2 Properties	Physical properties Chemical properties – reactions of carboxylic group and benzene.	Write equations.	Complete the following i)$C_6H_5COOH + C_2H_5OH$ ii) $C_6H_5COOH + NH_3$ iii) $C_6H_5COOH + Cl_2$	
Recognises the uses of benzoic acid in day to day life.	19.6.3 Uses	Mention the uses of benzoic acid.		What are the uses of benzoic acid?	
Learns the preparation of Salicylic acid.	19.7 Preparation of salicylic acid.	Preparation of salicylic acid from phenol.	Give the chemical equation.	Write preparation of salicylic acid from phenol.	

Understands the properties of salicylic acid.	19.7.1 Properties	Physical properties Chemical properties- reactions of phenolic group and carboxylic acid group.	Write the chemical equations.	Explain the reaction of salicylic acid with sodium carbonate and actylchloride.	
Recognises the uses of salicylic acid.	19.7.2 Uses	Mention the important uses			
Recognises the different functional derivatives of carboxylic acid.	19.8 Derivatives of carboxylic acids.	Mention the functional derivatives of carboxylic acid and give their nomenclature.	Tabulate the structural relationship among the derivatives with specific example.		
Learns the preparation and properties of acetyl chloride.	19.9.1 Preparation of acid chloride – acetyl chloride (CH_3COCl)	By action of pcl5 and $SOCl_2$ on carboxylic acids.		Complete the following. i)$CH_3COOH+PCl_5$✍ ii)$CH_3COOH+SOCl_2$✍	
	19.9.2 Properties	Physical properties Chemical properties – Representative reactions of acetyl chloride.	Write the chemical equations	Give the products of reaction of acetyl chloride i)Water ii)Ammonia iii)Ethanol	
Recognises the uses of acetyl chloride.	19.9.3 Uses	Mention its uses.			
Learns the preparation and properties of acetamide.	19.10 Preparation of acetamide	Preparation from ammonium acetate and methyl cyanide.	Represent with suitable equations.	Write the preparation of acetamide.	
	19.10.1 Properties	Physical properties Chemical properties- reaction with NaOH,HCl and P_2O_5		complete the following i)CH_3CONH_2+NaOH✍ ii)CH_3CONH_2+HCl✍	
Understands the preparation and properties of acetic anhydride.	19.11 Preparation of acetic anhydride.	By the reaction of acetyl chloride with sodium acetate	Give the chemical equations	How will you obtain acetic anhydride from acetyl chloride?	

	19.11.1 Properties	Physical properties Chemical properties- Hydrolysis,alco holyser, ammonolysis, reaction with HCl and PCl_5.	Write the chemical equations	Write the reactions of acetic anhydride with i)water ii)ammonid iii)HCl	
Learns the preparation and properties of methyl acetate.	19.12 Preparation of esters-methyl acetate	Esterification of carboxylic acid from acid chloride.	Give the chemical reactions.		
Understands the properties of methyl acetate.	19.12.1 Properties	Physical properties Chemical properties- Hydrolysis (both acid and alkali), alcoholysis and ammonolysis claisen ester condensation	Represent the reaction with suitable chemical equations	Write notes on claisen ester condensation.	

UNIT – XX Organic Nitrogen Compounds.

Recalls the nomenclature and isomerism in aliphatic nitro compounds	20.1 Aliphatic nitro compounds	Nomenclature and isomerism in aliphatic nitro compounds	Represent isomerism through structures	Discuss the isomerism exhibited by nitroalkanes.	
Learns preparation and properties	20.2.1 Preparation of aliphatic nitroalkanes.	Preparation from alkanes and alkyl halides.	Give the suitable chemical equations	What happens when methyl bromide is heated with silver nitrite in ethanol.	
	20.2.2 Properties	Physical properties Chemical properties Reduction, hydrolysis, halogenation, reaction with alkali, nitrous acid, aldehydes and ketones	Represent the chemical reactions with equations.	Discuss different reduction products of nitromethane	
Recognises the uses	20.2.3 Uses	Mention the synthetic uses of nitroalkanes			
	20.3 Aromatic	Draws Structure			

	nitro compounds	and names aromatic nitrocompounds .			
Learns the mechanism of nitration	20.3.1 Preparation	Nitration of benzene	Explain the mechanism	Give the mechanism of nitration of benzene	
Understands the reduction of nitrobenzene under different conditions.	20.3.2 Properties	Reduction of nitrobenzene	Show the experiments to illustrate the properties of nitrobenzene		
Identifies the uses of nitrobenzene	20.3.3 Uses				
Distinguishes based on tests	20.3.4 Distinction between aliphatic and aromatic nitro compounds.	Tabulate the distinguishing tests		Mention the tests to distinguish between aliphatic and aromatic nitro compounds.	
	20.4 Amines				
Recalls the structure	20.4.1 Aliphatic amines	Structure, nomenclature and classification into 1^o,2^o, and 3^o amines.	Explains the general formula, structure and classification		
Learns the general methods of preparation of aliphatic amines.	20.4.2 General methods of preparation.	Give the general methods of preparation	Write the chemical equations	Give the mechanism of Hoffmann method of preparation of methylamine	
Learns to write the chemical equations to explain the various reactions of amines	20.4.3 Properties	Physical properties chemical proerties	Explain the basic nature and important chemical reactions of amines.	Give short notes on the basic nature of aliphatic primary amines.	
Distinguishes between three types of amines	20.4.4 Distinction between 1^o,2^o, and 3^o amines.	Give distinguishing test between 1^o,2^o, and 3^o amines.	Tabulate the differences between 1^o,2^o, and 3^o amines.	Distinguish between aliphatic primary, secondary and tertiary amines.	
Recall the structure and types of aromatic amines.	20.4.5 Aromatic amines.	Types of aromatic amines.			

	20.4.6 Synthesis of benzylamine	Give the preparation of benzylamine	Gives equation of preparation	How is benzylamine prepared?	
	20.4.7 Properties	Physical properties Chemical properties	Explain the reaction with acids, alkylhalides, acid chloride and nitrous acid		
	20.4.8 Aniline –preparation.	Synthesis of aniline from nitrobenzene, chlorobenzene, and benzamide	Explain the chemical reactions.	How is aniline synthesised from nitro benzene?	
Recognises the properties of aromatic amines	20.4.9 Properties	Physical properties Chemical properties	Demonstrates the reactions of aniline and explain the basic nature of aniline.	Compare the basic nature of aliphatic and aromatic amines.	
	20.4.10 Uses	Mention the uses of aniline.			
	20.4.11 Distinction between aliphtic and aromatic amines.	Distinguish between athylamine and aniline benzylamine and aniline	Tabulate the differences	Differentiate aliphatic and aromatic amines.	
	20.5 Alipahtic nitrices	Structure and nomenclature of aliphatic nitriles.	Give equation for all the preparation and reactions.	How is methyl nitrile prepared? Mention its properties	
	20.5.1 Preparation	Give the general methods of preparation			
	20.5.2 properties	Physical and chemical properties			
	20.5.3 Uses	Give the synthetic uses			
Recognices benzene diazonium chloride	20.6 Diazonium salts	General formula and structure	Impresses the conditions of diazotisation		
	20.6.1 Preparation of benzene diazoniumchloride.	By diazotisation reaction of aniline		How is benzediazonium chloride prepared explain its synthetic importance.	
	20.6.2 Properties	Chemical properties reactions in	Explain with chemical equations		

		which nitrogen gas is liberated and reactions in which nitrogen atoms are retained.			

UNIT – XXI Biomolecules

Recognises the importance of carbohydrates, protein, amino acids and lipids	21.1 Carbohydrates	Classification of carbohydrates	Tabulate the list of classification	How are carbohydrates classified?	
	21.2 structural elucidation	Structural elucidation of glucose and fructose.		Elucidate the structure of fructose	
	21.3 Di-saccharides and polysaccharides	Mention the sources and their structure units	List the di-saccharides	Write the structure of sucrose	
	21.4 Proteins	Sources and their basic chemical units	Classifies the proteins	How are proteins classified?	
	21.4.1 Amino acids	Peptide linkage and formation of dipeptide	Illustrate the formation of peptide linkage by chemical equation	What is meant by peptide bond?	
	21.5 structure of proteins	Primary and secondary structure of proteins	Represents primary and secondary structure through diagrams	Discuss primary and secondary structure of protein	
	21.6 Nucleic acids	RNA and DNA elementary idea	Explains the functions of nucleic acid	What are RNA and DNA? Mention their functions	
	21.7 Lipids	Classification, structure and functions in biosystems	Tabulate the classification	What are lipids?	

UNIT – XXII CHEMISTRY IN ACTION

Recognises the importance of chemicals used as drugs	22.1 Medicinal chemistry	Anaesthetic, analgesics, Antipyretics, Antiseptics Antimalarials, antibiotics, Antacids, Antispasmodics.	Tabulate the drugs and their effects on curing of diseases	Mention the name of the drug and explain its action 1) antibiotics 2) anaesthetic s	
Impresses dauger of drug absue.	22.1.1 Drug abuse	Explains the bad effects of drug abuse is impressed	Consequences of drug abuse tabulated	What is the impact of drug abuse and how can it be prevented.	
Proposes the importance of dyes, cosmetics, creams, talcum powders and deodorants.	22.2 Dyes – classification and uses	Give the characteristics and classification of dyes and uses.	Tabulate the type of dyes, example and their uses.	What are dyes? How are they classified?	
	22.3 Cosmetics – creams, perfumes, talcum powder and deodorants.	Explains the preparation and their functions		What are perfumes? Explain their functions	
Learns the chemicals used in food.	22.4 chemical s in food 22.4.1 Preservatives artificial sweetening agents, antioxidants and edible colours.	Mention the names and their functions.		What are sweetening agents? Give examples.	
Recognises the importance of insect repellants and sex attractants	22.5 Insect repellant – pheromones and sex attractants	Explains the function and limitations		Mention the function of pheromones	
Proposes importance of rocket fuels.	22.6 Rocket fuels	Mentions the names of rocket fuels and their efficiency.		Explain the function of rocket fuels with examples.	
Learns about polymers	22.7 Types of polymers, preparation and uses.	Different methods of preparation of polymers and their properties.	List the polymers, explaining their nature, monomer and uses		

UNIT XXIII – PROBLEMS IN CHEMISTRY

Impresses the concept of chemistry through calculations	23.1 Problems in Organic Chemistry.	Explains to identify the nature of all functional groups in Organic chemistry and "name – reactions"	Worked-examples in each and every type of functional groups.	An organic compound (A) of molecular formula C_2H_7N is warmed with Sodium nitrate and hydrochloric acid, it gives compound (B) of molecular formula C_2H_6O. (A) also gives an offensive smelling liquid with $CHCl_3$ and alcoholic KoH. Strong oxidation of compound (B) gives compound (C) of molecular formula $C_2H_4O_2$. The calcium salt of (C) on dry distillation gives (D) of molecular formula C_3H_6O. Identify the compounds (A), (B), (C) and (D). Explain the reactions involved.	
	23.1 Problems in Inorganic chemistry	Represents Inorganic problems covering metals and non-metals.	Worked examples in p Block and d Block elements – and their compounds as specified in the text.(+2)	(A) Metal belongs to 6^{th} group and occupies 4^{th} poles extracted from its oxide ores. This element form an oxide (B) at 2000^0 C. The metals also forms an important compound (C) in which the oxidation number of the metal is +6. The compound (C) reacts with Nacl in presence of conc. H2SO4 giving red vapours (D) . Identify A,B,C and D and explain its reactions.	
	23.3 Problems in Physical Chemistry	Guides to work out problems in atomic – Structure, Chemical Equilibrium, Thermodynamics, Kinetics and in Electrochemistry.	Worked-out examples from portions +1 and +2.	3.42 gms of Sucrose ($C_{12}H_{22}O_{11}$) is dissolved in 100 gms of water. Calculate the Bpt of solution if Kb of water is 0.51 kg $^{-1}$k mole^{-1} and B.Pt of pure water is 373k.	

CHEMISTRY PRACTICALS FOR STD XII

I. Detection of Nitrogen, Halogen and Sulphur in organic compounds.

II. Detection of Functional groups present in organic compounds.

a) Saturation and Unsaturation
b) Aromatic and aliphatic
c) aldehydes, Carboxylic acids, diamides, phenolic groups-(Nature of any one functional group is identified)

III. Qualitative analysis

Determination of two cations and two anions in a given mixture.

Cations: Pb^{++}, Cu^{++}, AL^{3+}, Fe^{3+}, Zn^{2+}, Mn^{2+}, Ca^{++}, Ba^{2+}, Mg^{2+}, NH_4^+

Anions: Borate, Sulphide, Sulphate, Carbonate, Nitrate, Chloride, Bromide.

(Insoluble and interfering ions are to be excluded. Also, two cations of the same group and anions of the following) Combinations such as (Cl^- + Br^-) and (CO_3^{2-} + $C_2O_4^{2-}$) Should be avoided.

IV. Volumetric analysis

a) Permanganemetry

1. Titration of Oxalic acid Vs $KmnO_4$
2. Titration of ferrous ammonium sulphate against $KmnO_4$ solution.

b) Dichrometry

1. Standardization of $K_2Cr_2O_7$ solution.
2. Any one estimation using $K_2Cr_2O_7$ as one of the oxidant.

Report should contain two acid radicals and two basic radicals, without mentioning the name of the salt. Confirmatory test should be exhibited.

Mode of Examination (XII Std)

1) Organic analysis	(10)
2) Volumetric analysis	(10)
3) Qualitative analysis	(20)
4) Internal assesment	(10)
(Practical - 5 & Projects -5)	
	50

Investigatory Suggested Projects

A) I) Analysis of Soil
ii) Water analysis - Hardness, Softness
iii) Analysis of dissloved oxygen in Sewage water
iv) Analysis of salts in ground water

v) Preparation of Soap, Shampoo, talcum powder, inks, detergents, tooth powder, chalk, snow, redoxide, indelible ink, phenyle, candle, agarbathi, perfumes, rosewater, sodawater. Preparation of biscuts, cakes, ice-creams.

B) Study of common food adultrants in fat, oil, butter, sugar, turmeric powder, chilly powder, coffee powder, tea dust and dye-vegetables.

Note: Any other innovative projects :-

- Can be performed which involves about-
  Periods of work with the approved of the teacher.

The investigatory projects should be given to +2 students and Internal marks should be alloted from and among the projects. This scheme is introduced so as to enable the students acquiring knowledge about cottage industries and to update their practical knowledge.