Class: XII
Subject: CHEMISTRY

TERM-1

NO. OF PERIOD	TOPIC	SUB-TOPIC	LEARNING OBJECTIVES / SKILLS TO BE DEVELOPED	ASSIGNMENT/ACTIVITY	LEARNING OUTCOMES
13	**THE SOLID STATE**	General Ccharacterstics of Solid :	*describe general characteristics of solid state;		Learners will be able to know about the characteristics of solid state
		Classification of solids	• distinguish between amorphous and crystalline solids;	Work-Sheet-1	Learners will be able to understand the points of difference between amorphous and crystalline solids;
		Types of unit cell	• classify crystalline solids on the basis of the nature of binding forces;		Learners will be able to know the types of crystalline solids on the basis of the nature of binding forces;
		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 know the types of packing and efficiency of packing in solids
		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

		Electrical and magnetic properties of solid	• correlate the electrical and magnetic properties of solids and their structure.	Work-Sheet-1B	Learners will be able to understand the Electrical and magnetic properties of solid
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic	UNIT-1-THE SOLID STATE	
15	**SOLUTIONS**	*Types of solution*	· Describe the different types of solution	EX-2:1 to 2:3	Learners will be able to know the types of solution
		Concentration of solution in different units	· Express concentration of solution in different units.	EX-2:4 Preparation of solution in different units in lab.	Learners will be able to understand the Concentration of solution in different units
		Henry's Law and Raoult's law	· State and explain Henry's law and Raoult's law.	Work-Sheet-2	Learners will be able to understand the Henry's Law and Raoult's law & its applications in life
		Ideal and non-ideal solutions	· Distinguish between ideal and non-ideal solutions.		Learners will be able tounderstand the difference between ideal and non-ideal solutions.
			· Explain deviations of real solutions from Raoult's law.	EX-2:5 to2:11	
		Colligative properties	· Describe colligative properties and correlate these with molecular masses of the solutes	EX-2:12 to2:13 Work-Sheet-2A	Learners will be able to know that what is Colligative properties & how to determine the molecular mass of solute

		Abnormal molecular mass	· Explain abnormal colligative properties exhibited by some solutes in solutions		Learners will be able to understand that why the molecular mass ess of abnormal
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic	UNIT-2-SOLUTIONS	
15	**HALOALKANES AND HALOARENES**	IUPAC nomenclature	Develops skill in writing trivial and IUPAC nomenclature of Haloalkanes and Haloarenes.	Work-Sheet-10	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	EX-10:1 &10:2 Work-Sheet-10A	Learners will be able to understand the methods of preparation Haloalkanes and Haloarenes
		Physical and chemical properties and nature of C-X bond in haloalkanes and haloarenes.	· Describe and explain their physical and chemical properties.	EX-10:3 Work-Sheet-10B	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 substitution reaction.	· Understand the mechanism and stereo chemistry involved in nucleophilic substitution reaction.	EX-10:4 to 10:9 Work-Sheet-10C	Learners will be able to know the mechanism and stereo chemistry involved in nucleophilic substitution reaction.

		Uses and environmental effect of CH 2Cl 2, CHCl 3,CCl 4, CHI 3, Freons, DDT	· Study the uses and environmental effect of CH 2Cl 2, CHCl 3, CCl 4, CHI 3, Freons, DDT		Learners will be able to understand the uses and environmental effect of these compounds in our life
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic	**UNIT-10- HALOALKANES AND HALOARENES**	
14	**ELECTROCHEMISTRY**	*Electrochemical cell*	· Describe an electrochemical cell and differentiate between galvanic and electrolytic cell, define standard potential of the cell	EX-3:1	Learners will be able to understand the diffrences between galvanic and electrolytic cell
		Nernst equation	· 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.	EX-3:2&3:3 Work-Sheet-3	Learners will be able to understand to calculate the emf of galvanic cell and .Gibbs energy of reaction and its equilibrium constant.
		Electrolytic conductors , conductivity and molar conductivity	Differentiate between ionic (electrolytic) and electronic conductivity Define resistivity , conductivity and molar conductivity of ionic solutions.	EX-3:4 & 3:5	Learners will be able to know that the types of conductors

			Learn the method for measurement of conductivity of electrolytic solutions and calculation of their malar conductivity	EX-3:7 to 3:9	Learners will be able to understand to measure the conductivity of electrolytic solutions and calculation of their malar conductivity
			Justify the variation of conductivity and molar conductivity of solutions with changein their concentration	Work-Sheet-3A	Learners will be able to understand the variation of conductivity and molar conductivity of solutions with changein their concentration
		Kohlrasuch law	Enunciate Kohlrausch law and learn its applications.		Learners will be able to know about the Kohlrausch law and learn its applications.
		Electrolysis	Understand the quantitative aspects of electrolysis		Learners will be able to Understand the quantitative aspects of electrolysis
		Corrosion	Understand corrosion as an electrochemical process.	Work-Sheet-3B	Learners will be able to Understand about the corrosion and how to prevent it
		Primary and secondary cell	Describe the construction of some primary and secondary batteries and fuel cells.	Explaination was given with the help of dry cell	Learners will be able to Understand about the types of cell and use of it in life
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic	**UNIT-3-ELECTROCHEMISTRY**	

14	**CHEMICAL KINETICS**	General Introduction & Rate of reaction	Define the rate of reaction	L	Learners will be able to know about chemical kinetics & rate of reaction
		Avg. rate and instantaneous rate	· Define the average and instantaneous rate of a reaction and express it in terms of change in concentration of either of thereactants or product with time	EX-4:1&4:2	Learners will be able to Understand the average and instantaneous rate of a reaction
		Order and molecularity	· Distinguish between elementary (one step) and complex reactions (multiple steps)	EX-4:3&4:4	Learners will be able to Understand the differences between elementary (one step) and complex reactions (multiple steps)
		Rate law	· Describe the molecularity of elementary reactions and order of simple and complex reactions		Learners will be able to Understand the difference between Order and molecularity of reactions
		Integrated rate expression for zero and first order reaction	· Define rate constant and describe the dependence of the rate of reaction on the concentration of the reactants	Work-Sheet-4	Learners will be able to Understand the Integrated rate expression for zero and first order reaction

			· Deerive the integrated rate expression for zero and first order reaction	EX-4:5 to 4:9	
			· Define half life time of a reaction		Learners will be able to Understand the Integrated rate expression for zero and first order reaction
			Corelate 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	EX-4:10 & 4:11-Work-Sheet-4A	Learners will be able to Understand the temperature dependence of rate constant in terms of Arrhenius equation
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic	**UNIT-4-CHEMICAL KINETICS**	
15	**UNIT-11-ALCOHOLS, PHENOLS & ETHERS**	IUPAC nomenclature	· Name of alcohols, phenols and ethers according to trivial and IUPAC system of nomenclature.	EX-11:1 to 11:5	Learners will be able to know how to write the trivial and IUPAC name of alcohols, phenols,ethers,

		Preparation & properties of alcohols	· Describe and explain the reactions involved in the Preparation & properties of alcohols	Work-Sheet-11,11A&11B	Learners will be able to Understand the Preparation & properties of alcohols
		Preparation & properties of phenols	· Describe and explain the reactions involved in the Preparation & properties of phenols	EX-11:6 & 11:7	Learners will be able to Understand the Preparation & properties of phenols
		Preparation & properties of ethers,	· Describe and explain the reactions involved in the Preparation & properties of ethers	Lab activity to test alcohols, phenols and ethers.	Learners will be able to Understand the Preparation & properties of ethers
		Uses of alcohols, phenols and ethers.	Explain the uses of alcohols, phenols and ethers.	Lab activity to distinguish between alcohols, phenols and ethers.	Learners will be able to Understand the uses of alcohols, phenols and ethers In our life.
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic	**UNIT-11-ALCOHOLS, PHENOLS & ETHERS**	
20	**UNIT-12 ALDEHYDES, KETONES ANDCARBOXYLIC ACID**	IUPAC nomenclature,	· Write the trivial and IUPAC names of aldehydes, ketones,	EX-12:1 Work-Sheet-12	Learners will be able to know how to write the trivial and IUPAC name of aldehydes, ketones,

		preparation & properties aldehydes ketones,	· Describe the important methods of their preparation and reactions of aldehydes & ketones	EX-12:2 to12:4 Work-Sheet-12A&B	Learners will be able to Understand the Preparation & properties of aldehydes & ketones
		distinction between aldehydes & ketones	· Understand the chemical reactions of these classes of compounds	Lab activity to distinguish between aldehydes & ketones	Learners will be able to distinguish between aldehydes & ketones
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic	**UNIT-12 ALDEHYDES, KETONES**	
		preperation of carboxylic acid	· Describe and explain the reactions involved in the preparation of carboxylic acid	EX-12:5	Learners will be able to Understand the Preparation & properties of carboxylic acid
		properties of carboxylic acid	· Understand the chemical reactions of carboxylic acid	Work-Sheet-12C	
		Some important members of aldehydes,ketones and carboxylic acid	· Learn the chemistry of some commercially important members of these families of compounds.	Lab activity to test carboxylic acid	Learners will be able to know about some important members of aldehydes,ketones and carboxylic acid
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic	**UNIT-12 CARBOXYLIC ACID**	

10	**UNIT-5- SURFACE CHEMISTRY**	*Adsorption*	· Describe interfacial phenomenon and its importance		Learners will be able to understand the diffrences between physical and chemical adsorption
			Define adsorption and classify it into physical and chemical adsorption•	Work-Sheet-05	
			· Learn about factors controlling adsorption from gases and solutions on solids.		Learners will be able to know about Freundlich adsorption isotherms.
			Correlate adsorption results on the basis of Freundlich adsorption isotherms.	Lab activity to distinguish between solution,colloids & suspension	
		Colloids	Understand the nature of the colloidal state,	Work-Sheet-05 A	Learners will be able to understand the various types of colloids & its specific name
			learn the preparation and properties of various types of colloids and its uses		Learners will be able to Understand the Preparation & properties of various types of colloids and its uses in life
		Catalysis	· Describe the types of catalysis - homogeneous and heterogeneous	Lab activity to show the catalytic action in the reactions	Learners will be able to understand the various types of catalysis - homogeneous and heterogeneous

			· Mechanism of enzyme catalysed reaction.	Work-Sheet-05A	Learners will be able to understand about the various types of catalytic reaction takes place in life
		SURFACE CHEMISTRY	Preparation of one lyophilic and one lyophobic sol.	(a) Preparation of one lyophilic and one lyophobic sol.	Learners will be able to know the methods of preparation of colloids
				Lyophilic sol - starch, egg albumin and gum	
				Lyophobic sol - aluminium hydroxide, ferric hydroxide, arsenious sulphide.	
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic	**UNIT-5-SURFACE CHEMISTRY**	
10	**UNIT-13-AMINES**	*IUPAC nomenclature,*	· Write the trivial and IUPAC names of amines.		Learners will be able to know how to write the trivial and IUPAC name of amines
		preparation of Amines	· Describe the important methods of preparation of Amines	EX-13:1&13:3	Learners will be able to Understand the Preparation & properties of amines
		properties of Amines	Basic character of Amines	Work-Sheet-13A	
			Reaction with Electrophiles and miscellaneous Reactions	EX-13:4	

		, preparation and properties of Diazo Compounds)	· Describe the important methods of preparation of Diazo compounds		Learners will be able to Understand the Preparation & properties of amines
			Reactions involving Displacement of Diazo group,and Retention of Diazo group	EX-13:5	
		Test of Amines	Distinguish between the primary,secondary and tertiary amines	Lab activity to distinguish between solution,colloids & suspension	Learners will be able to perform the test to distinguish between the primary,secondary and tertiary amines amines
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic	**UNIT-13-AMINES**	
10	**UNIT-9-CO-ORDINATION COMPOUNDS**	*Some Important Terms used in Co-ordination compounds*	Know the meaning of the terms: co-ordination entity (complex) central atom, ligand, co-ordination number, co- ordination polyhedron, oxidation number, denticity and chelation		Learners will be able to know the meaning of some important terms
		Nomenclature	· Learn the rules of nomenclature of co-ordination compounds.	EX-9:2 & 9:3	Learners will be able to know how to write the IUPAC name of co-ordination compounds and its formulae

			Write the formulae and names of mononuclear co-ordination compounds.		
		Isomerism	· Describe and predict the different types of isomerism in coordination compounds	EX-9:2 & 9:3	Learners will be able to Understand the different types of isomerism in coordination compounds
		Bonding in coordination compounds: Werner's ,Valance bond and crystal field theory of Co-ordination compounds	Understand the nature of bonding in co-ordination compounds in terms of Werner's, Valence Bond and Crystal Field theories	Work-Sheet-9 & 9A	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
		Stability of coordination compound	Explain the stability of co-ordination compounds	EX-9:4 to 9:6	Learners will be able to know the stability of co-ordination compounds
		Metal carbonyls,	· Briefly describe the bonding in metal organometallic compounds.	6. Preparation of Inorganic Compounds	Learners will be able to Understand the Metal carbonyls, Application of coordination compounds in our life
		Application of coordination	Appreciate the importance and applications of co-ordination	(a) Preparation of double salt of ferrous ammonium sulphate or potash alum.	
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic as per CBSE	(b) Preparation of potassium ferric oxalate.	

			recommendation		
8	**UNIT-15-POLYMERS**	*Classification, mechanism of polymerization,*	· Appreciate that some simple small molecules called monomers undergo repeated addition / condensation reactions to form high molecular mass species called macromolecules or polymers.	EX-15:1	Learners will be able to understand the various types of polymers and mechanism of polymerization,
			· Learn about the formation of polymers by different modes	Work-Sheet-15	
		Some important polymers, their monomers and application.	· List the monomers of various polymers.	Work-Sheet-15 A	Learners will be able to know the monomers of Some important polymers and their application in daily life
			· Appreciate that a large variety of articles of daily use are made from polymers.		
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic as per CBSE recommendation	**UNIT-15-POLYMERS**	

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List of Practicals – TERM 1

6	**Qualitative analysis**	Salt analysis	Determination of one cation and one anion in a given salt.	To identify the given salt in lab	Learnres will be able to identify the given salt
		Anions:	CO_3^{2-},S^{2-},SO_3^{2-},Cl^-,Br^-,I^-,NO_3^- ,CH_3COO^-,SO_4^{2-},PO_4^{3}		
		Cations:	(a) Pb^{2+},Cu^{2+},As^{3+},Al^{3+}, Fe^{3+},Mn^{2+},Co^{2+},Zn^{2+},Ni^{2+},Ca^{2+},Sr^{2+},B a^{2+},Mg^{2+},NH_4^+		
2	**Chromatography**	***Separation of pigments***	Separation of pigments from extracts of leaves and flowers by paper chromatography and determination of Rf values.	To separate the pigments from extracts of leaves and flowers	Learnres will be able to separate the pigments from extracts of leaves and flowers & find its Rf value.
4	**Test for the functional groups**	Test for the functional groups present in organic compounds:	Unsaturation, alcoholic, phenolic, aldehydic, ketonic, carboxylic and amino (primary) groups.	To detect the funtional groups of organic compounds	Learnres will be able to identify the funtional groups of organic compounds
	Test of food stuffs	Test of food stuffs	Study of carbohydrates, fats and proteins in pure form and detection of their presence in given food stuffs.	To test of food stuffs	Learnres will be able to detect of carbohydrates, fats and proteins from the given food stuffs.

TERM 2

8	**UNIT-6-GENERAL PRINCIPLE AND PROCESSES OF ISOLATIONOF ELEMENTS**	*Principles and methods of extractions. Steps involved in metallurgy*	· List and describe the various steps involved in the metallurgy i.e. concentration, oxidation, reduction and refining.	EX-06:1 to 06:4	Learnres will be able to understand the various steps involved in the metallurgy i.e. concentration, oxidation, reduction and refining.
		Refining of Metals	Describe the different processes for Refining	Work-Sheet-06	Learnres will be able to understand the different processes for Refining
		Occurrence and extraction of Al, Cu, Zn and IronFeasibility of a reaction-Ellingum diagram.	· Describe the steps involved in the extraction of Al, Cu, Zn and Fe. • To choose the right reducing agent for the reduction of the metal oxide with the help of Ellingum diagram		Learnres will be able to know the steps involved in the extraction of Al, Cu, Zn and Fe.
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic as per CBSE recommendation	**UNIT-6-GENERAL PRINCIPLE AND PROCESSES OF ISOLATIONOF ELEMENTS**	

10	**UNIT-8-d-AND f-BLOCK ELEMENTS**	**General Introduction & Electronic configuration**	Justify the position of the d-and f-blocks of elements in the periodic table		Learnres will be able to understand the position of the d-and f-blocks of elements in the periodic table & its electronic configurations
			· Learn the electronic configurations of d-and f-block elements.		
		Characteristics of d and f block elements	· Know the general properties of the transition elements with special reference to group trends.	EX-08:1 to 8:9	Learnres will be able to understand the general properties of the transition elements
		Preparation and properties of K 2Cr 2O7,	Describe the preparation and properties of, K 2Cr 2O 7, KmnO4		Learnres will be able to learn the preparation and properties of, K 2Cr 2O 7, KmnO4
		Preparation and properties of , KMnO4			
		Lanthanides contraction & Actinides	Describe the properties of f-block elements (lanthanides and actinides).	Work-Sheet-8 & 8 A	Learnres will be able to understand the general properties of the properties of f-block elements & Lanthanides & Actinides contraction
			· Describe the cause and consequence of lanthanides		

			contraction.		
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic as per CBSE recommendation	**UNIT-8-d-AND f-BLOCK ELEMENTS**	
16	**UNIT-7-p-BLOCK ELEMENTS**	*General trends in the chemistry of elements of group 15, 16, 17 and 18*	Appreciate the general trends in the chemistry of elements of group 15, 16 ,17.and 18.	EX-07:1 to 7:21	Learnres will be able to understand the general trends in the chemistry of elements of group 15, 16 ,17.and 18.
		Preparation and properties of certain compounds of these groups	To know about the allotropes of sulphur and phosphorous.		Learnres will be able to learn the preparation and properties ofcertain compounds of these groups
			· Describe the preparation, properties and uses of Oxygen, ozone, nitrogen,		
			Ammonia, nitric acid, phosphine, sulphur-di-oxide, Sulphuric acid, chlorine and hydrochloric acid. Flurides and oxides of Xenon.	Work-Sheet-7 &7 A	

		Structure of oxides of group-15, oxo- acid of group 16 & 17 and some compounds of Xenon.	· Draw the structure of oxide of nitrogen, oxoacid of sulphur, halogens and some compounds of Xenon.		Learnres will be able to Draw the structure of oxide of nitrogen, oxoacid of sulphur, halogens and some compounds of Xenon.
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic as per CBSE recommendation	**UNIT-7-p-BLOCK ELEMENTS**	
6	**UNIT-14-BIOMOLECULES**	*Carbohydrates,*	Learn about the preparation, structure,properties and uses of carbohydrates		Learnres will be able to learn the preparation, structure,properties and uses of carbohydrates
		proteins	Describe the primary, secondary and tertiary structures of proteins List their functions in human body.	Work-Sheet-14 &14 A	Learnres will be able to learn the structures of proteins and its functions in human body.
		nucleic acid	· Differentiate between DNA and RNA		Learnres will be able to understand the differences between DNA and RNA and its funtions in life
			· Describe the double helical structure of DNA		

		Vitamin	Classify Vitamins and appreciate its importance and also list the disease caused by the deficiency of these vitamins.		Learnres will be able to understand the various types of Vitamins,its importance and also list the disease caused by the deficiency of these vitamins.
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic as per CBSE recommendation		
4	**UNIT-16-CHEMISTRY IN EVERYDAYLIFE**	*Drugs*	Visualise the importance of chemistry in daily life		Learnres will be able to understand the importance of chemistry in daily life. Such as drugs,medicines,chemicals in food, soaps and detergents
		Therapeutic Action of Different Classes of Drugs	*analgesics, tranquillizers, antiseptics, disinfectants, antibiotics, antimicrobials, antihistamines, antifertility drugs and antacids*	Work-Sheet-16 & 16 A	
		Chemicals in food	*Chemicals in food preservatives,*		

			sweetening agents, antioxidants		
		Soaps and detergents	Discuss the chemistry of cleansing agent		
			Classify detergents into anionic, cationic and non-ionic categories		
		Feedback test	They will be tested about knowledge, understanding, application and skill of the topic as per CBSE recommendation		

List of Practicals – TERM 2

5	Volumetric Analysis	Volumetric Analysis	. Determination of concentration/molarity of KmnO4 solution by titrating it against a standard solution of:	To fetrmine the molarity of KmnO4 solution by titrating it against a standard solution of (a) Oxalic acid (b) Ferrous ammonium sulphate	Learnres will be able to find out the molarity of KmnO4 solution
			(a) Oxalic acid		
			(b) Ferrous ammonium sulphate		