CHOITHRAM SCHOOL, MANIK BAGH, INDORE

ANNUAL CURRICULUM PLAN SESSION 2017 – 2018

CLASS: XII

SUBJECT: CHEMISTRY

Month & Working Days	Theme/ Sub-theme	Learning Objectives		Activities &Resources	Expected Learning Outcomes	Assessment
		Subject Specific (Content Based)	**Behavioural (Application based)**			
MARCH (12)	**SOLUTIONS:** • different types of solutions; •concentration of solution in different units; • Henry's law and Raoult's law; • ideal and non-ideal solutions deviations of real solutions from Raoult's law; describe colligative properties of solutions and correlate these with molar masses of the solutes; explain abnormal colligative properties exhibited by some solutes in solutions.	Students will learn to : • Describe the formation of different types of solutions • Express concentration of solution in different units • State and explain Henry's law and Raoult's law • Understand the difference between ideal and non ideal solutions • Explain the deviations of real solutions from Raoult's	Students will be able to • Dissolve samples of solute in a suitable solvent keeping in view solute solvent interactions • Choose a suitable factor to enhance solubility or decrease the same as per the need • Demonstrate the use of concentrated and dilute solutions in daily life • Apply the effect of addition of a	> Volumetric Analysis $KMnO_4$ vs. Mohr's Salt Solution	Students will learn to • Describe the formation of different types of solutions • Express concentration of solution in different units • State and explain Henry's law and Raoult's law • Understand the difference between ideal and non ideal solutions • Explain the deviations of real solutions from Raoult's law • Describe the colligative properties of	Solving numerical on molarity , molality ,mole fraction and ppm.

		law • Describe the colligative properties of solutions • Explain abnormal colligative properties and correlate these to association or dissociation of the specific entity. • Employ strategies to overcome the atmospheric conditions to deal with a situation like scuba diving, boiling at high altitudes etc.	non volatile solute to decrease the freezing point of water or any other solvent and increase the boiling point of water or any other solvent as required . • Utilize the concept of osmosis in injecting isotonic saline solutions . • Appreciate the use of saline water to treat sore throat. • Appreciate the process of dialysis in the human system . • Prepare different category of solutions for various studies and researches. • Illustrate examples from daily life to relate the effect		solutions • Explain abnormal colligative properties and correlate these to association or dissociation of the specific entity.	

			of pressure differences on living system. • Employ strategies to overcome the atmospheric conditions to deal with a situation like scuba diving, boiling at high altitudes etc.			
APRIL (21)	**p-BLOCK ELEMENTS** • periodic table and the properties with reference to p-block elements. • 15 group elements: general trends in properties, preparation of nitrogen , different allotropes of phosphorus,their prep. And properties, oxides of nitrogen and phosphorus, halides and oxoacids of phosphorus and nitrogen. • 16 group elements: general trends in	**SOLUTIONS & p-BLOCK ELEMENTS** **Students will be able to** • Know the importance of studying p-block elements and their compounds. • Recall the periodic table and the properties with reference to p-block elements. • Know 15 group elements:	Students will learn to • Apply the knowledge of various reactions like use of smoke screens. • After studying innumerable uses of elements and compounds , they will be able to demonstrate a wide range of ideas and use elements and compounds very intelligently like using Cl_2 as	• Volumetric Analysis $KMnO_4$ vs. Oxalic Acid Solution • **Activity 1 : <u>to be done in the lab</u>** reaction of Cu^{2+} and NH_4OH to form a coloured complex . • Tests for ammonia : **Activity 2 : <u>to be done in the lab</u>** <u>reaction of Nesseler's reagent and NH_3 to give a brown precipitate</u> • Laboratory preparation of nitric acid and its manufacture along with its physical and chemical properties. A few properties will be	Studentswill learn to : • Describe the formation of different types of solutions • Express concentration of solution in different units • State and explain Henry's law and Raoult's law • Understand the difference between ideal and non ideal solutions • Explain the deviations of real solutions from Raoult's law • Describe the	Questions from NCERT text book on p-block elements.

	properties, preparation of oxygen , different allotropes of oxygen their prep. and properties, oxides of sulphur , halides and oxoacids of sulphur and contact process. • 17 group elements: general trends in properties , oxoacids of F, Cl, Br and I. Acidic behavior of the same • **18 group elements** general trends in properties	general trends in properties, preparation of nitrogen , different allotropes of phosphorus,their prep. And properties, oxides of nitrogen and phosphorus, halides and oxoacids of phosphorus and nitrogen. • Know 16 group elements: general trends in properties, preparation of oxygen , different allotropes of oxygen their prep. and properties, oxides of sulphur , halides and oxoacids of sulphur and contact process.	bleaching agent at home , using aqua regia as cleaning agent for gold ornaments etc. • Appreciate the use of various noble gases in various fields like Ne in fluorescent bulbs, He in oxygen cylinder etc.	delivered through chalk and board and a few more through activities. • **Activity 3 :** testing HNO_3 with blue litmus , decomposing carbonates to release CO_2	colligative properties of solutions • Explain abnormal colligative properties and correlate these to association or dissociation of the specific entity.	

		• 17 group elements: general trends in properties , oxoacids of F, Cl, Br and I. Acidic behavior of the same				
June (12)	**d & f BLOCK ELEMENTS** •oxidation states of the elements. •various reactions of the elements and their compounds. • preparation, properties and uses of the elements and their important compounds electronic configurations of the transition (d-block) and the inner transition (f-block) elements; • relative stability of various oxidation states in terms of electrode potential values; • preparation, properties, structures and uses of some important compounds such as K2Cr2O7 and KMnO4; •understand the general characteristics of the d–	Students will be able to • learn the positions of the *d*– and *f*-block elements in the periodic table; • know the electronic configurations of the transition (*d*-block) and the inner transition (*f*-block) elements; ● appreciate the relative stability of various oxidation states in terms of electrode potential values; ● describe the preparation, properties,	● To make students understand and realize the importance of transition (change) in every aspect of life. ● Students will appreciate the importance and use of alloys in their surroundings so as to carefully use them and spread awareness about the same. ● They will develop their logical and critical thinking skills after having discussions on various behaviors of d and f block elements. ● Sensitivity towards	Teacher will **demonstrate** and the Students will **perform** the following identifying tests (chemical reactions) under qualitative analysis to study the properties of the compounds. (i) Chromyl chloride test (ii) Nesseler's reagent test Salt analysis for detection of Mn^{2+}, Zn^{2+}, Cr^{3+}, Co^{2+}, Ni^{2+} etc. ions	• Students have learnt about the process and importance of change (transition) in properties of elements from metallic to non-metallic end and now they can predict the probable properties of elements situated at particular places in the periodic table. They can appreciate and understand the importance of change in life. • Students have learnt to understand and explain the trends in properties of d and f block	• General discussion of properties of d and f block elements • NCERT text book questions

	and f–block elements and the general horizontal and group trends in them; **TO BE CONTINUED IN THE NEXT MONTH….**	structures and uses of some important compounds such as $K_2Cr_2O_7$ and $KMnO_4$; ● understand the general characteristics of the *d*– and *f*–block elements and the general horizontal and group trends in them; ● describe the properties of the *f*-block elements and give a comparative account of the lanthanoids and actinoids with respect to their electronic configurations, oxidation states and chemical behaviour.	environmental protection and judicial use of transition metal compounds will be developed. ● They will be able to apply the knowledge of use of various transition metals in medicine, biological phenomena, storage, comfortable living, industries and agriculture.		elements and now they can reason the abnormalities, similarities and variation in properties of the elements. • Students can write various reactions related to preparation & properties of $K_2Cr_2O_7$ and $KMnO_4$ and deduce their structure. • Students can appreciate and justify the cause of using alloys and transition metal compounds in various fields in their surroundings. • Students can identify transition elements and their compounds on the basis of their characteristics. • Students can extend their knowledge of using the transition metals & their compounds	

					judiciously, to create awareness about the same.	
July (24)	**….CONTINUED** **d & f BLOCK ELEMENTS COORDINATION CHEMISTRY** • properties of the f-block elements and comparative account of the lanthanoids and actinoids with respect to their electronic configurations, oxidation states and chemical behaviour. •postulates of Werner's theory of coordination compounds; • coordination entity, central atom/ ion, ligand, coordination number, coordination sphere, coordination polyhedron, oxidation number, homoleptic and heteroleptic; • rules of nomenclature of coordination compounds; • formulae and names of mononuclear coordination compounds; • different types of isomerism in coordination	**:**Students will be able to • Understand and appreciate the postulates of Werner's theory of coordination compounds; • know the meaning of the terms: coordination entity, central atom/ ion, ligand, coordination number, coordination sphere, coordination polyhedron, oxidation number, homoleptic and heteroleptic, denticity; • learn the rules of nomenclature of coordination compounds; • write the formulas and names of mononuclear coordination compounds;	Students will be able to develop insights into the functioning ofvital components of biological systems. They will know that Chlorophyll, hemoglobin and vitamin B12 are coordination compounds of magnesium, iron and cobalt respectively. On the same line they will be able **to apply** the understanding of coordination linkages& entities to the existence & formation of various compounds of industrial, agricultural, medicinal and biological importance. • Students intending to pursue further studies in the field of science will be able **to correlate** these concepts with and reason effectively about the cause and effect	• Qualitative Inorganic analysis • Students will be involved in problem solving (a set of questions to be discussed in class) based on the above aspects for better understanding of the introductory part of the unit.	• Students will learn to write structure and IUPAC names of coordination compounds and they can explain about all terms used in coordination chemistry for in depth study of complexes. • They can identify various coordination compounds and can predict some of their properties after carrying out complete analysis of the composition, bonding, structure, geometry and related features of the compounds. • They can apply VBT and CFT	NCERT questions from the Coordination compounds

	compounds; • nature of bonding in coordination compounds in terms of the Valence Bond and Crystal Field theories; • stability of coordination compounds; •applications of coordination compounds in our day to day life.	• define different types of isomerism in coordination compounds; • understand the nature of bonding in coordination compounds in terms of the Valence Bond and Crystal Field theories; • learn the stability of coordination compounds; • Appreciate the importance and applications of coordination compounds in our day to day life.	relationship in a variety of metallurgical processes, industrial catalysis and analyses. • They will be able to **sensitize people** about thoughtful use of chemical resources in context of their advantages & disadvantages, availability and scarcity. • They will get aware of environmental hazards of using some of the coordination compounds so as to further sensitize people about the same. • Students will appreciate the formation of gem stones as application of formation of coordination compounds. They will develop their **analytical skills** while undergoing in depth		to explain the bonding and related features in coordination entities. • They have learnt to describe the structural features of the organometallic compounds and their application in biological, medicinal, industrial and agricultural fields. • They have learnt to differentiate between useful and harmful effects of using coordination compounds and can create awareness in people about the same.	

			study of structure, bonding, isomerism and properties of coordination compounds.			
August (21)	**HALOALKANES AND HALOARENES:** • Nomenclature of haloalkanes and haloarenes according to the IUPAC system • reactions involved in the preparation of haloalkanes and haloarenes . • correlate the structures of haloalkanes and haloarenes with various types of reactions; • stereochemistry; •applications of organo-metallic compounds; • environmental effects of polyhalogen. **ALCOHOLS, PHENOLS AND ETHERS :** Nomenclature of alcohols, phenols and ethers according to the IUPAC system reactions involved in the preparation of alcohols from (i) alkenes (ii) aldehydes,	Students will be able to • name haloalkanes and haloarenes according to the IUPAC system of nomenclature from their given structures; • describe the reactions involved in the preparation of haloalkanes and haloarenes and understand various reactions that they undergo; • correlate the structures of haloalkanes and haloarenes with various types of reactions; • use stereochemistry as a tool for understanding the reaction mechanism; • highlight the uses and environmental effects of	Students will be able to • name haloalkanes and haloarenes according to the IUPAC system of nomenclature from their given structures; • describe the reactions involved in the preparation of haloalkanes and haloarenes and understand various reactions that they undergo; • correlate the structures of haloalkanes and haloarenes with various types of reactions; • use stereochemistry as a tool for understanding the reaction mechanism; • highlight the uses and environmental effects of polyhalogen compounds.	• Qualitative Inorganic analysis • draw the resonating structure of haloarenes	IUPAC nomenclature of halogen containing compounds and their classification ● about various reagents used in preparation of fluoro,chloro, bromo,iodo alkanes and in aryl halides. ● Physical and chemical properties of haloalkanes, haloarenes and electrophilic substitution reaction given by haloarenes. ● mechanism of SN^1 & SN^2 reaction and reactivity of primary, secondary and tertiary alkyl halides. ● Stereo chemical aspects of nucleophilic substitution reaction i.e. inversion, retention and racemisation of configuration. ● to convert haloalkanes to alkanes and alkenes ● about the ambident nuleophiles and the products obtained on reaction with haloalkanes. ●about beneficial and	Practice questions: Conversions

	ketones and carboxylic acids; **TO BE CONTINUED IN THE NEXT MONTH….**	polyhalogen compounds.			hazardous effects of poly halogen compound.	
September (20)	**….CONTINUED** **ALCOHOLS, PHENOLS AND ETHERS :** • reactions involved in the preparation of phenols from (i) haloarenes (ii) benzene sulphonic acids (iii) diazonium salts and (iv) cumene; • reactions for preparation of ethers from (i) alcohols and (ii) alkyl halides and sodium alkoxides/aryloxides; • physical properties of alcohols, phenols and ethers with their structures; • chemical reactions of the three classes of compounds on the basis of their functional groups. **ALDEHYDES,**	Students will be able to ● Name Alcohol, phenol and ethers according to the IUPAC system of nomenclature from their given structures ● describe the reactions involved in the preparation of alcohols phenol and ether ● correlate physical properties of alcohols, phenols and ethers with ● their structures ● Understand chemical	● Students will learn the use of **phenol** as an antiseptic in soaps, lotion and ointments and for treating wounds caused by the bite of mad dogs as a disinfectant, fungicide and bactericide, use of **alcohol** as a fuel, as an antiseptic in hospitals, as a preservative for biological specimen. ● Students will appreciate the use of **phenol** in manufacture of drugs like Aspirin, Salol, Phenacitin, use of **diethyl ether**	Detection 0f alcoholic and phenolic groups in the given organic compound**.**	The students will learn ● To name alcohols, phenols and ethers according to the IUPAC system of nomenclature ● The reactions involved in the preparation of **alcohols** from ● alkenes (ii) aldehydes, ketones and carboxylic acids ● **phenols** from ● (i) haloarenes (ii) benzene sulphonic acids (iii) diazonium salts and (iv)cumene ● **ethers** from ● (i) alcohols (ii) alkyl halides and sodium alkoxides/aryloxide s ● Difference in physical properties	Questions on resonance and organic conversions

	KETONES AND CARBOXYLIC ACIDS , AMINES, POLYMERS common and IUPAC names of aldehydes, ketones and carboxylic acids; • structures of the compounds containing functional groups namely carbonyl and carboxyl groups; • important methods of preparation and reactions of these classes of compounds; •physical properties and chemical reactions of aldehydes, ketones and carboxylic acids, with their structures; • mechanism of a few selected reactions of aldehydes and ketones; • factors affecting the acidity of carboxylic acids and their reactions • uses of aldehydes, ketones and carboxylic acids. Method of preparation of amines and their properties, distinguishing tests for primary ,	reactions of the three classes of compounds on ● the basis of their functional groups. ● Highlight the uses of alcohol, phenol and ether	as a refrigerant and an inhalation anaesthetic in surgery as it produces unconsciousnes s without affecting lungs and heart, use of **methanol** in the preparation of dyes, medicines and perfumes, use of ethanol in manufacture of beverages. ● Students will be sensitized about the harmful effects of consumption of ethanol on human health and will be aware how consumption of alcohol leads to addiction and lack of control and coordination in the body which may result in		on the basis of intermolecular forces. ● Chemical properties of alcohol, phenol and ethers and corresponding chemical equations. ● Electrophilic substitution reaction of phenol and aromatic ethers. ● Uses of alcohol, phenol and ethers and harmful effects of drinking alcohol	

	secondary and tertiary amines. Classification of polymers and their preparation and properties. **ELECTROCHEMISTRY** electrochemical cell and difference between galvanic and electrolytic cells **TO BE CONTINUED IN THE NEXT MONTH…**		accidents. • Students will analyse ill effects of drinking alcohol on society. • Students will be familiarized about denaturation of ethanol to make it unfit for drinking. • Students will recognize the drunken person by performing acidified $K_2Cr_2O_7$ solution test.			
October (08)	**….CONTINUED** **ELECTROCHEMISTRY & CHEMICAL KINETICS** • Nernst equation for calculating the emf of galvanic cell and standard potential of the cell • relation between standard potential of the cell, Gibbs energy of cell reaction and its equilibrium constant • resistivity , conductivity	Students will be able to learn: • To describe an electrochemical cell and differentiate between galvanic and electrolytic cells • to apply Nernst equation for	Students will be able to : • develop insights into the functioning of cells and batteries in everday life. • They will develop an insight to enhance the efficiency of the cells and	Plotting graphs between molar conductance and concentration, plotting graph for 1 and 2 order reactions conc. vs time	Students will learn : • To describe an electrochemical cell and differentiate between galvanic and electrolytic cells; • to apply Nernst equation for calculating the emf of galvanic cell and define standard potential of the	Solving numerical on Nernst equation and half life

	(k) and molar conductivity m) of ionic solutions • difference between ionic (electrolytic) and electronic conductivity; • measurement of conductivity of electrolytic solutions and calculation of their molarconductivity • variation of conductivity and molar conductivity of solutions with change in their concentration (molar conductivity at zero concentration or infinite dilution) • Kohlrausch law and its applications • quantitative aspects of electrolysis • construction of some primary and secondary batteriesand fuel cells • corrosion as an electrochemical process.	calculating the emf of galvanic cell and define standard potential of the cell • derive relation between standard potential of the cell, Gibbs energy of cell reaction and its equilibrium constant • define resistivity , conductivity and molar conductivity of ionic solutions • To describe the method for measurement of conductivity of electrolytic solutions and calculation of their molar conductivity	batteries by choosing an appropriate cathode and anode.		cell; • to derive relation between standard potential of the cell, Gibbs energy of cell reaction and its equilibrium constant; • to define resistivity (r), conductivity (k) and molar conductivity (L m) of ionic solutions; • To describe the method for measurement of conductivity of • Students will be able to develop insights into the functioning of cells and batteries in everday life. • They will develop an insight to enhance the efficiency of the cells and batteries.	
November	**EXTRACTION AND**	Students will be able	Students will be able to	Presentation (video on	Students will learn to :	Discussion on the

(21)	**ISOLATION (METALLURGY)& BIOMOLECULES :** • minerals, ores, concentration, benefaction, calcination, roasting, refining, etc.; • principles of oxidation and reduction as applied to the extraction procedures; • application of thermodynamic concepts like that of Gibbs energy and entropy to the principles of extraction of Al, Cu, Zn and Fe **BIOMOLECULES :** • define the biomolecules like carbohydrates, proteins and nucleic acids; • classification of carbohydrates, proteins, nucleic acids and vitamins on the basis of their structures • explain the difference between DNA and RNA.	to : explain the terms minerals, ores, concentration, benefaction, calcination, roasting, refining, etc.; • understand the principles of oxidation and reduction as applied to the extraction procedures; • apply the thermodynamic concepts like that of Gibbs energy and entropy to the principles of extraction of Al, Cu, Zn and Fe. Understand the process of refining. • define the biomolecules like carbohydrates, proteins and nucleic acids; • classify carbohydrates, proteins, nucleic acids and vitamins on the basis of their structures • explain the	: • of biomolecules in biosystem • relate the metallurgical operations going on in the factories to the appreciate the role obtaining of metals. • Understand the importance of resources and the elaborative procedures that it takes to obtain a piece of metal.	metallurgical operations)	explain the terms minerals, ores, concentration, benefaction, calcination, roasting, refining, etc.; • understand the principles of oxidation and reduction as applied to the extraction procedures; • apply the thermodynamic concepts like that of Gibbs energy and entropy to the principles of extraction of Al, Cu, Zn and Fe. Understand the process of refining. • define the biomolecules like carbohydrates, proteins and nucleic acids; • classify carbohydrates, proteins, nucleic acids and vitamins on the basis of their structures • explain the difference between DNA and RNA of biomolecules in biosystem. • Understand the importance of resources and the elaborative procedures that it takes to obtain a piece of metal.	video and NCERT exercise questions

		difference between DNA and RNA;				
December (20)	**SOLID STATE & CHEMISTRY IN EVERYDAY LIFE :** • general characteristics of solid state; • amorphous and crystalline solids; • classification of crystalline solids on the basis of the nature of binding forces; • crystal lattice and unit cell; •close packing of particles; • types of voids and close packed structures; • calculate the packing efficiency of different types of cubic unit cells; • density of a substance with its unit cell properties; • imperfections in solids and their effect on properties; • electrical and magnetic properties of solids and their structure. the importance of Chemistry in daily life; • the basis of classification	Students will learn to: describe general characteristics of solid state; • distinguish between amorphous and crystalline solids; • classify crystalline solids on the basis of the nature of binding forces; • define crystal lattice and unit cell; • explain close packing of particles; • describe different types of voids and close packed structures; • calculate the packing efficiency of different types of cubic unit cells; • correlate the density of a substance with its unit cell properties; imperfections in solids and their effect on properties; • electrical and magnetic properties of	Students will learn : • The characters of imperfect solids and will then be able to interpret the type of property that it will exhibit. • To visualize the magnetic and electrical properties of substances in daily life. • visualise the importance of Chemistry in daily life; • sweetening agents and food preservatives and will be able to use suitable sweeteners and preservatives in daily life • to become more aware about various products being	Video presentation	Students will learn to: describe general characteristics of solid state; • distinguish between amorphous and crystalline solids; • classify crystalline solids on the basis of the nature of binding forces; • define crystal lattice and unit cell; • explain close packing of particles; • describe different types of voids and close packed structures; • calculate the packing efficiency of different types of cubic unit cells; • correlate the density of a substance with its unit cell properties; imperfections in solids and their effect on properties; • electrical and magnetic properties of solids and their structure. visualise the importance of	• NCERT text book questions from the exercise and within the text. • Numericals from NCERT text book on the calculation of density and formula determination

	of drugs; • drug-target interaction of enzymes and receptors; • drugs function in the body; • artificial sweetening agents and food preservatives; • chemistry of cleansing agents.	solids and their structure. visualise the importance of Chemistry in daily life; • explain the term chemotherapy • describe the basis of classification of drugs • explain drug-target interaction of enzymes and receptors; • explain how various types of drugs function in the body; • know about artificial sweetening agents and food preservatives; • discuss the chemistry of cleansing agents.	used in daily life like antiseptics and disinfectants, antibiotics , antipyretics etc.		Chemistry in daily life; • explain the term 'chemotherapy'; • describe the basis of classification of drugs; • explain drug-target interaction of enzymes and receptors; • explain how various types of drugs function in the body; • know about artificial sweetening agents and food preservatives; • discuss the chemistry of cleansing agents. The characters of imperfect solids and will then be able to interpret the type of property that it will exhibit. To visualize the magnetic and electrical properties of substances in daily life. visualise the importance of Chemistry in daily life; sweetening agents and food preservatives and will be able to use suitable sweeteners and preservatives in daily life • to become more aware about various products being used in daily life like antiseptics and	

					disinfectants, antibiotics , antipyretics etc.	