DAV Public School

Sec-3, Dhurwa, Ranchi - 4

Session 2019-20

Class - XI Science (Chemistry)

Topic / Syllabus to be taught month wise.

Jul-19	**Chapter 1** **Some Basic Concepts of Chemistry** General Introduction: Importance and scope of chemistry. Nature of matter, laws of chemical combination, Dalton's atomic theory: concept of elements, atoms and molecules. Atomic and molecular masses, mole concept and molar mass, percentage composition, empirical and molecular formula, chemical reactions, stoichiometry and calculations based on stoichiometry.	Periods - 12 Marks - 5
	Chapter 2 **Structure of Atom** Bohr's model and its limitations, concept of shells and subshells, dual nature of matter and light, de Broglie's relationship, Heisenberg uncertainty principle, concept of orbitals, quantum numbers, shapes of s, p and d orbitals, rules for filling electrons in orbitals - Aufbau principle, Pauli's exclusion principle and Hund's rule, electronic configuration of atoms, stability of half-filled and completely filled orbitals.	Periods - 14 Marks - 6
	Monthly Test - Chapter 1 (30 Marks)	
Aug-19	**Chapter - 3** **Classification of Elements and Periodicity in Properties** Modern periodic law and the present form of periodic table, periodic trends in properties of elements -atomic radii, ionic radii, inert gas radii, Ionization enthalpy, electron gain enthalpy, electronegativity, valency. Nomenclature of elements with atomic number greater than 100	Periods - 8 Marks - 4
	Chapter 4 **Chemical Bonding and Molecular structure** Valence electrons, ionic bond, covalent bond, bond parameters, Lewis structure, polar character of covalent bond, covalent character of ionic bond, valence bond theory, resonance, geometry of covalent molecules, VSEPR theory, concept of hybridization, involving s, p and d orbitals and shapes of some simple molecules, molecular orbital theory of homonuclear diatomic molecules(qualitative idea only), hydrogen bond.	Period - 14 Marks - 5
	Chapter 5 **Chemical Thermodynamics** Three states of matter, intermolecular interactions, types of bonding, melting and boiling points, role of gas laws in elucidating the concept of the molecule, Boyle's law, Charles law, Gay Lussac's law, Avogadro's law, ideal behaviour, empirical derivation of gas equation, Avogadro's number, ideal gas equation. Deviation from ideal behaviour, liquefaction of gases, critical temperature, kinetic energy and molecular speeds (elementary idea) Liquid State: vapour pressure, viscosity and surface tension (qualitative idea only, no mathematical derivations)	Period - 12 Marks - 4
	Monthly Test - Chapter 2 and 3 (30 Marks)	

Sep-19	**Revision of Chapter 1, 2 ,3 ,4 & 5 and Half Yearly Exam**	
Oct-19	**Chapter 6** **Chemical Thermodynamics** Concepts of System and types of systems, surroundings, work, heat, energy, extensive and intensive properties, state functions. First law of thermodynamics -internal energy and enthalpy, heat capacity and specific heat, measurement of ΔU and ΔH, Hess's law of constant heat summation, enthalpy of bond dissociation, combustion, formation, atomization, sublimation, phase transition, ionization, solution and dilution. Second law of Thermodynamics (brief introduction).Introduction of entropy as a state function, Gibb's energy change for spontaneous and non- spontaneous processes, criteria for equilibrium. Third law of thermodynamics (brief introduction).	Periods - 16 Marks - 6
	Chapter - 7 **Equilibrium** Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of mass action, equilibrium constant, factors affecting equilibrium- Le Chatelier's principle, ionic equilibrium- ionization of acids and bases, strong and weak electrolytes, degree of ionization, ionization of poly basic acids, acid strength, concept of pH, Henderson Equation, hydrolysis of salts (elementary idea), buffer solution, solubility product, common ion effect (with illustrative examples).	Periods - 14 Marks - 6
	Monthly Test - Chapter - 6 (30 Marks)	
Nov-19	**Chapter 8** **Redox Reactions** Concept of oxidation and reduction, redox reactions, oxidation number, balancing redox reactions, in terms of loss and gain of electrons and change in oxidation number, applications of redox reactions.	Periods - 6 Marks - 3
	Chapter - 9 **Hydrogen** Position of hydrogen in periodic table, occurrence, isotopes, preparation, properties and uses of hydrogen, hydrides-ionic covalent and interstitial; physical and chemical properties of water, heavy water, hydrogen peroxide - preparation, reactions and structure and use; hydrogen as a fuel.	Periods - 8 Marks - 3
	Chapter - 10 **s-Block Elements (Alkali and Alkaline Earth Metals)** Group 1 and Group 2 Elements General introduction, electronic configuration, occurrence, anomalous properties of the first element of each group, diagonal relationship, trends in the variation of properties (such as ionization enthalpy, atomic and ionic radii), trends in chemical reactivity with oxygen, water, hydrogen and halogens, uses. Preparation and Properties of Some Important Compounds: Sodium Carbonate, Sodium Chloride, Sodium Hydroxide and Sodium Hydrogencarbonate, Biological importance of Sodium and Potassium. Calcium Oxide and Calcium Carbonate and their industrial uses, biological importance of Magnesium and Calcium	Periods - 10 Marks - 5
	Monthly Test - Chapter - 7 & 8 (30 Marks)	

Dec-19	**Chapter - 11** **p -Block Elements** General Introduction to p -Block Elements Group 13 Elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous properties of first element of the group, Boron - physical and chemical properties, some important compounds, Borax, Boric acid, Boron Hydrides, Aluminium: Reactions with acids and alkalies, uses. Group 14 Elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous behaviour of first elements. Carbon-catenation, allotropic forms, physical and chemical properties; uses of some important compounds: oxides. Important compounds of Silicon and a few uses: Silicon Tetrachloride, Silicones, Silicates and Zeolites, their uses.	Periods - 14 Marks - 5
	Chapter -12 **Organic Chemistry - Some Basic Principles and Techniques** General introduction, methods of purification, qualitative and quantitative analysis, classification and IUPAC nomenclature of organic compounds. Electronic displacements in a covalent bond: inductive effect, electromeric effect, resonance and hyper conjugation. Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions, electrophiles and nucleophiles, types of organic reactions.	Periods - 14 Marks - 7
	Monthly Test - Chapter - 9, 10 & 11 (30 Marks)	
Jan - 20	**Chapter - 13** **Hydrocarbons** Classification of Hydrocarbons Aliphatic Hydrocarbons: Alkanes - Nomenclature, isomerism, conformation (ethane only), physical properties, chemical reactions including free radical mechanism of halogenation, combustion and pyrolysis. Alkenes - Nomenclature, structure of double bond (ethene), geometrical isomerism, physical properties, methods of preparation, chemical reactions: addition of hydrogen, halogen, water, hydrogen halides (Markownikov's addition and peroxide effect), ozonolysis, oxidation, mechanism of electrophilic addition. Alkynes - Nomenclature, structure of triple bond (ethyne), physical properties, methods of preparation, chemical reactions: acidic character of alkynes, addition reaction of - hydrogen, halogens, hydrogen halides and water. Aromatic Hydrocarbons: Introduction, IUPAC nomenclature, benzene: resonance, aromaticity, chemical properties: mechanism of electrophilic substitution. Nitration, sulphonation, halogenation, Friedel Craft's alkylation and acylation, directive influence of functional group in monosubstituted benzene.Carcinogenicity and toxicity.	Periods - 12 Marks - 8
	Monthly Test - Chapter - 12 & 13 (30 Marks)	
	Chapter - 14 **Environmental Chemistry** Environmental pollution - air, water and soil pollution, chemical reactions in atmosphere, smog, major atmospheric pollutants, acid rain, ozone and its reactions, effects of depletion of ozone layer, greenhouse effect and global warming- pollution due to industrial wastes, green chemistry as an alternative tool for reducing pollution, strategies for control of environmental pollution.	Periods - 6 Marks - 3

Syllabus For Half Yearly Exam -2019		
Chapter	**Chapter Name**	**Marks**
1	Some Basic Concepts of Chemistry	10
2	Structure of Atom	18
3	Classification of Elements and Periodicity in Properties	11
4	Chemical Bonding and Molecular structure	15
5	States of Matter: Gases and Liquids.	16
Total		**70**

Syllabus For Annual Exam -2020		
Chapter	**Chapter Name**	**Marks**
1	Some Basic Concepts of Chemistry	5
2	Structure of Atom	6
3	Classification of Elements and Periodicity in Properties	4
4	Chemical Bonding and Molecular structure	5
5	States of Matter: Gases and Liquids.	4
6	Chemical Thermodynamics	6
7	Equilibrium	6
8	Redox Reactions	3
9	Hydrogen	3
10	s-Block Elements (Alkali and Alkaline Earth Metals)	5
11	p -Block Elements	5
12	Organic Chemistry - Some Basic Principles and Techniques	7
13	Hydrocarbons	8
14	Environmental Chemistry	3
Total		**70**