

CHEMISTRY SYLLABUS

CLASS - XI (2018-19)

FIRST TERM

APRIL

- **SOME BASIC CONCEPTS OF CHEMISTRY**
 - *Precision and Accuracy*
 - *Dimensional Analysis*
 - *Laws of Chemical Combination and Numerical Problems*
 - *Mole Concept and Numerical Problems*
 - *Empirical and Molecular Formulae*
 - *Chemical Equivalents and Volumetric Calculations*
 - *Chemical Reactions and Numerical Problems*
- **STRUCTURE OF ATOM**
 - *Subatomic Particles: Their Discovery and Properties*
 - *Rutherford's Nuclear model and its Limitations*
 - *Electromagnetic Wave Theory and Quantum theory : Numerical Problems*
 - *Types Of Spectra*
 - *Bohr's Atomic Model and Related Concepts: Numerical Problems*
 - *Quantum Mechanical Model of an Atom*
 - ✓ *de Broglie's Equation and Numerical Problems*
 - ✓ *Heisenberg's Uncertainty Principles Numerical Problems*
 - ✓ *Schrodinger's Wave Equation*
 - ✓ *Quantum numbers*
 - ✓ *Aufbau Principle and (n+l) rule*
 - ✓ *Pauli's Exclusion Principle*
 - ✓ *Hund's Rule of Maximum multiplicity*
 - ✓ *Electronic Configuration of Atoms*
- **PRACTICALS**
 - *Detection of Anions : Dilute acid Group*
 - *Confirmatory Tests for Dilute Acid Group Anions*

MAY

- **CLASSIFICATION OF ELEMENTS AND PERIODIC PROPERTIES**
 - *Mendeleev's Periodic Law and its Limitations*
 - *Modern Periodic Law*
 - *Long form Periodic Table*
 - *Periodic Trends in Properties of Elements*
 - ✓ *Atomic radius, Ionic radius and Covalent radius*
 - ✓ *Ionization Enthalpy*
 - ✓ *Electron Gain Enthalpy*
 - ✓ *Factors which affect these Properties*
 - *Periodic Trends in Chemical Properties*
- **CHEMICAL BONDING AND MOLECULAR STRUCTURE**
 - *Kossel-Lewis Approach to Chemical Bonding*
 - *Formation and Characteristics of Electrovalent Bond*
 - ✓ *Formation of Cation and Anion*

- ✓ *Variable Electronegativity and Reasons*
- ✓ *Born-Haber Cycle*
- ✓ *Lewis Structure of NaCl, Li₂O, MgO, CaO, MgF₂, Na₂S.*
- **Formation and Characteristics of Covalent Bond**
 - ✓ *Formation and Types of Covalent Bond*
 - ✓ *Polar and Non-polar covalent Bond*
 - ✓ *Reason for Variable Covalency*
 - ✓ *Lewis Structure of CH₄, NH₃, H₂O, CO₂, ethane, ethene, ethyne.*
 - ✓ *Comparison of Electronegativity and Covalency*
 - ✓ *Formal charge of Ions*
- **Deviation from Octet rule and Fajan's Rule**
- **VSEPR Theory and Hybridisation**
- **Co-ordinate Bond and Structure of Some Molecules**
- **Resonance in Simple Inorganic Molecules**
- **Hydrogen Bonding**
- **Molecular Orbital Theory**
- **PRACTICALS**
 - *Detection of Anions : Concentrated Acid Group*
 - *Confirmatory Tests for Concentrated acid group Anions*

JUNE

- **REDOX REACTIONS**
 - *Concept of Oxidation and Reduction*
 - *Oxidation number*
 - *Balancing Redox Reactions in Acidic and Basic medium by Oxidation number and Ion-electron Method*

JULY

- **ORGANIC CHEMISTRY : SOME BASIC PRINCIPLES AND TECHNIQUES**
 - *Introduction to Organic Chemistry*
 - *Classification of Organic Compounds*
 - *IUPAC Rules for Naming of Organic Compounds*
 - *Structural Isomerism in Organic Compounds*
 - *Geometrical Isomerism*
 - *Optical Isomerism*
 - *Qualitative Detection of Elements present in Organic Compounds*
 - *Estimation of Carbon, Hydrogen, Nitrogen, Halogens, Sulphur and Phosphorus*
 - *Types of Chemical Reactions and their Mechanisms*
 - *Free Radicals and Polar Mechanisms*
- **HYDROGEN AND HYDROGEN PEROXIDE**
 - *Hydrogen : The Element*
 - *Hydrides*
 - *Water : Properties, Hard and Soft water and Heavy water*
 - *Hydrogen peroxide : Preparation and Properties*
 - *Calculation of Strength of Hydrogen peroxide*
- **THE STATES OF MATTER : GASES AND LIQUIDS**
 - *Intermolecular Interactions*
 - *The Gas Laws and Numerical Problems*
 - *Dalton's Law and Graham's law: Numerical problems*
 - *Ideal Gas Equation and Related Calculations*

- *Kinetic Theory of Gases*
- *Non-ideal Behavior of Gases and Liquefaction*
- *Liquid state*

- **PRACTICALS**

- *Group -I Cations*
- *Group-II Cations*
- *Group -III Cations*
- *Group -IV Cations*

AUGUST

- **ALIPHATIC HYDROCARBONS : ALKANES**

- *Occurrence and Conformation*
- *General Methods of Preparation*
- *Physical and Chemical Properties*
- *Uses*

- **ALIPHATIC HYDROCARBONS : ALKENES**

- *General Methods of Preparation*
- *Physical and Chemical Properties*
- *Markownikoff's Rule with Mechanism*
- *Saytzeff's Rule and its Application*
- *Uses*

- **GROUP- I : ALKALI METALS**

- *General Characteristics of Alkali metals*
- *Distinctive Behavior of Lithium*
- *Preparation, Properties and Uses of Some Important Compounds*
 - ✓ *Sodium chloride*
 - ✓ *Sodium hydroxide*
 - ✓ *Sodium carbonate and bicarbonate*
 - ✓ *Sodium thiosulphate*
- *Biological Importance of Sodium and Potassium*

- **PRACTICALS**

- *Cations of Groups - V, VI and zero*
- *Volumetric Analysis : Acid-Base Titration*

SEPTEMBER

- **IMPORTANT CHEMICAL REACTIONS AND CONVERSIONS**

- *Involving Inorganic Compounds*
- *Involving Organic Compounds*

- **PRACTICALS**

- *Systematic Salt Analysis*
- *Acid-Base Titration*

SECOND TERM

OCTOBER

- **GROUP-2 : ALKALINE - EARTH METALS**
 - *General Characteristics of Group-II*
 - *Anomalous Behavior of Beryllium*
 - *Some Important Compounds : Preparation, Properties and Uses*
 - ✓ *Magnesium chloride hexahydrate*
 - ✓ *Calcium oxide*
 - ✓ *Calcium carbonate*
 - ✓ *Plaster of Paris*
 - ✓ *Manufacture of Cement*
 - *Biological Importance of Magnesium and Calcium*
- **ALIPHATIC HYDROCARBONS : ALKYNES**
 - *General Methods of Preparation*
 - *Physical and Chemical Properties*
 - *Acidic Character of Alkynes*
 - *Uses of alkynes*
 - *Distinguishing Tests between Alkanes, Alkenes and Alkynes*
- **PRACTICALS**
 - *Paper Chromatography : Separation of Pigments of Black-ink*
 - *Identification of one Cation and one Anion present in the Salt*

NOVENBER

- **CHEMICAL THERMODYNAMICS**
 - *System and Surroundings*
 - *Properties and State of System*
 - *Thermodynamic Process and Equilibrium*
 - *First Law of Thermodynamics and its Significance*
 - *Work, Heat and Internal energy*
 - *Heat Capacity and Enthalpy change*
 - *Second Law of Thermodynamics*
 - *Entropy*
 - *Free -energy Change*
 - *Statement of Third Law*
 - *Related Numerical Problems using Different concept*
- **GROUP - 13 ELEMENTS**
 - *General Characteristics of Group-13 Elements*
 - *Anomalous Behavior of Boron*
 - *Physical and Chemical Properties of Boron*
 - *Reactions of Aluminium*
 - *Preparation and Properties of some Important Compounds*
 - ✓ *Borax and Borax Test*
 - ✓ *Diborane*
 - ✓ *Boric acid*

✓ *Alums*

- **AROMATIC HYDROCARBONS : BENZENE**
 - *Introduction and Nomenclature*
 - *Aromaticity*
 - *Structure of Benzene*
 - *Preparation of Benzene*
 - *Properties of Benzene*
 - *Directive Influence of Functional groups in Monosubstituted Benzene*
 - *Carcinogenicity and Toxicity of Benzene and Uses*
- **PRACTICALS**
 - *Preparation of Inorganic Compounds : potash alum*
 - *Paper chromatography*

DECEMBER

- **CHEMICAL EQUILIBRIUM**
 - *Introduction : Reversible and Irreversible Changes*
 - *Physical Equilibrium*
 - *Chemical Equilibrium*
 - *Derivation and Relationship between K_c and K_p*
 - *Le Chatelier's Principle*
 - *Factors Affecting Physical and Chemical Equilibrium*
- **GROUP-14 ELEMENTS**
 - *General Characteristics*
 - *Inert-pair Effect*
 - *Anomalous Behavior of the First Element*
 - *Catenation and Allotropy in Carbon : Diamond, Graphite and Fullerene*
 - *Preparation, properties and Uses of some Important Compounds*
 - ✓ *Carbon monoxide*
 - ✓ *Carbon dioxide*
 - ✓ *Silicon dioxide*
 - ✓ *Silicon carbide*
 - ✓ *Silicon tetrachloride*
 - ✓ *Silicones*
 - ✓ *Silicates and Zeolites*
- **PRACTICALS**
 - *Volumetric Analysis: Percentage Purity of Given Sample*

JANUARY

- **IONIC EQUILIBRIUM**
 - *Strong and Weak electrolytes and Non-electrolytes*
 - *Ostwald's Dilution Law and Numericals*
 - *Arrhenius, Bronsted-Lowry and Lewis Concept of Acids and Bases*
 - *Ionic Product of Water : pH, pOH, pK_w*
 - *pH Indicators and their Choice in Titrimetry*
 - *Numerical Problems*

- *Common-ion Effect*
- *Salt hydrolysis*
- *Buffer Solutions*
- *Solubility product*
- *Numerical on pH, buffer and solubility*
- **ENVIRONMENTAL CHEMISTRY**
 - *Types of Environmental Pollution*
 - *Gaseous pollutants*
 - *Particulate Pollutants*
 - *Water Pollutants*
 - *Soil Pollutants*
- **PRACTICALS**
 - *Volumetric analysis : Determination of Water of Crystallisation*

FEBRUARY

- **REVISION**