

# CHEMISTRY

Month	Ch. No.	Chapter	Contents
March-April	I	Solutions	<ul style="list-style-type: none"><li>Types of solutions.</li></ul>
			<ul style="list-style-type: none"><li>Expression of concentration of solutions of solids in liquids</li></ul>
			<ul style="list-style-type: none"><li>Solubility of gases in liquid, solid in liquid.</li></ul>
			<ul style="list-style-type: none"><li>Colligative properties: relative lowering of vapour pressure, Raoult's law, elevation of boiling point, depression of freezing point, osmotic pressure</li></ul>
			<ul style="list-style-type: none"><li>Determination of molecular masses using colligative properties</li></ul>
			<ul style="list-style-type: none"><li>Abnormal molecular mass, Vant Hoff factor</li></ul>
April	II	Electrochemistry	<ul style="list-style-type: none"><li>EMF of a cell, standard electrode potential</li></ul>
			<ul style="list-style-type: none"><li>Nernst equation and its application to chemical cells.</li></ul>
			<ul style="list-style-type: none"><li>Relation between Gibbs energy change and EMF of a cell. Conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration.</li></ul>
			<ul style="list-style-type: none"><li>Kohlrausch's Law.</li></ul>
			<ul style="list-style-type: none"><li>Electrolysis and laws of electrolysis (elementary idea)</li></ul>
			<ul style="list-style-type: none"><li>Dry cell – electrolytic cells and galvanic cells.</li></ul>
			<ul style="list-style-type: none"><li>Fuel cells; corrosion.</li></ul>
May	UT-1		
May	III	Chemical Kinetics.	<ul style="list-style-type: none"><li>Rate of a reaction (average and instantaneous)</li></ul>
			<ul style="list-style-type: none"><li>Factors affecting rates of reaction.</li></ul>
			<ul style="list-style-type: none"><li>Order and molecularity of a reaction</li></ul>
			<ul style="list-style-type: none"><li>Rate law and specific rate constant, integrated, rate equations and half life (only for zero and first order reactions)</li></ul>
			<ul style="list-style-type: none"><li>Activation energy, Arrhenius equation</li></ul>
			<ul style="list-style-type: none"><li>Concept of collision theory (elementary idea, no mathematical treatment)</li></ul>
June	IX	Haloalkanes And Haloarenes	<ul style="list-style-type: none"><li>Haloalkanes: Nomenclature, nature of C-X bond, physical and chemical properties, mechanism of substitution reactions. Optical isomerism.</li></ul>
			<ul style="list-style-type: none"><li>Haloarenes: Nature of C-X bond, substitution reactions (directive influence of halogen for monosubstituted compounds only).</li></ul>
			<ul style="list-style-type: none"><li>Uses and environmental effects of – dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT.</li></ul>
July	UT-2		

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July	X	Alcohols, Phenols And Ethers	<ul style="list-style-type: none"> <li>Alcohols: Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only); identification of primary, secondary and tertiary alcohols; mechanism of dehydration, uses, with special reference to methanol and ethanol.</li> </ul>
			<ul style="list-style-type: none"> <li>Phenols: Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophilic substitution reactions, uses of phenols.</li> </ul>
			<ul style="list-style-type: none"> <li>Ethers: Nomenclature, methods of preparation, physical and chemical properties, uses.</li> </ul>
July	XI	Aldehydes, Ketones And Carboxylic Acids	<ul style="list-style-type: none"> <li>Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, and mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes; uses.</li> <li>Carboxylic Acids: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses</li> </ul>
July	XII	Organic Compounds Containing Nitrogen	<ul style="list-style-type: none"> <li>Preparation, physical and chemical properties, uses, identification of primary secondary and tertiary amines.</li> </ul>
			<ul style="list-style-type: none"> <li>Cyanides and Isocyanides – will be mentioned at relevant places in context.</li> </ul>
			<ul style="list-style-type: none"> <li>Diazonium salts: Preparation, chemical reactions and importance in synthetic organic chemistry.</li> </ul>
August	VI	The p-block Elements	<ul style="list-style-type: none"> <li>Group 16 elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; dioxygen: preparation, properties and uses; classification of oxides; ozone. Sulphur – allotropic forms; compounds of sulphur: preparation, properties and uses of sulphur dioxide; sulphuric acid: industrial process of manufacture, properties and uses, oxoacids of sulphur (structures only).</li> </ul>
			<ul style="list-style-type: none"> <li>Group 17 elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; compounds of halogens: preparation, properties and uses of chlorine and hydrochloric acid, interhalogen compounds, oxoacids of halogens (structures only).</li> </ul>
			<ul style="list-style-type: none"> <li>Group 18 elements: General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses.</li> </ul>

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August	IV	Surface Chemistry.	<ul style="list-style-type: none"> <li>• Adsorption – physisorption and chemisorptions.</li> </ul>
			<ul style="list-style-type: none"> <li>• Factors affecting adsorption of gases on solids</li> </ul>
			<ul style="list-style-type: none"> <li>• Catalysis-Homogenous and heterogeneous catalysis, activity and selectivity: enzyme catalysis</li> </ul>
			<ul style="list-style-type: none"> <li>• Colloidal state: distinction between true solutions, colloids and suspensions; classification of colloids</li> </ul>
			<ul style="list-style-type: none"> <li>• Preparation, purification, properties and protection of colloids</li> </ul>
			<ul style="list-style-type: none"> <li>• Emulsions – types of emulsions.</li> </ul>
August	V	General Principles And Processes of Isolation of Elements	<ul style="list-style-type: none"> <li>• Principles and methods of extraction – concentration, oxidation, reduction electrolytic method and refining;</li> <li>• Occurrence and principles of extraction of aluminium, copper, zinc and iron.</li> </ul>
September	<b>Revision And Block Test 1</b>		
October	VII	The d - and f - block Elements	<ul style="list-style-type: none"> <li>• General introduction ,electronic configuration, occurrence and characteristics of transition metals,</li> </ul>
			<p>general trends in properties of the first row transition metals – metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation.</p> <ul style="list-style-type: none"> <li>• Preparation and properties of <math>K_2Cr_2O_7</math> and <math>KMnO_4</math>.</li> </ul>
			<ul style="list-style-type: none"> <li>• Lanthanoids – electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences.</li> </ul>
			<ul style="list-style-type: none"> <li>• Actinoids – Electronic configuration, oxidation states and comparison with lanthanoids .</li> </ul>
November	VIII	Coordination Compounds	<ul style="list-style-type: none"> <li>• Coordination compounds : Introduction, Werner's theory, ligands, coordination number, colour, magnetic properties and shapes</li> </ul>
			<ul style="list-style-type: none"> <li>• IUPAC nomenclature of mononuclear coordination compounds,</li> </ul>
			<ul style="list-style-type: none"> <li>• isomerism (structural and stereo)</li> </ul>
			<ul style="list-style-type: none"> <li>• Bonding, VBT, CFT</li> </ul>
			<ul style="list-style-type: none"> <li>• Importance of coordination compounds (in qualitative analysis, extraction of metals and biological systems)."</li> </ul>

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November	XIII	Biomolecules	<ul style="list-style-type: none"><li>Carbohydrates – Classification (aldoses and ketoses), monosaccharide (glucose and fructose), D-Lconfiguration, oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen):importance.</li></ul>
			<ul style="list-style-type: none"><li>Proteins - Elementary idea of a - amino acids, peptide bond, polypeptides, proteins, primary structure,secondary structure, tertiary structure and quaternary structure (qualitative idea only), denaturation of proteins; enzymes.</li></ul>
			<ul style="list-style-type: none"><li>Hormones –Elementary idea (excluding structure).</li></ul>
			<ul style="list-style-type: none"><li>Vitamins – Classification and functions.</li></ul>
			<ul style="list-style-type: none"><li>Nucleic Acids: DNA and RNA</li></ul>
November	XIV	Polymers	<ul style="list-style-type: none"><li>Classification – Natural and synthetic, methods of polymerization (addition and condensation),copolymerization.</li></ul>
			<ul style="list-style-type: none"><li>Some important polymers: natural and synthetic like polythene, nylon, polyesters, bakelite,rubber.</li></ul>
			<ul style="list-style-type: none"><li>Biodegradable and non-biodegradable polymers</li></ul>
November	XV	Chemistry In Everyday Life	<ul style="list-style-type: none"><li>Chemicals in food- analgesics, tranquilizers, antiseptics, disinfectants, antimicrobials,antifertility drugs, antibiotics, antacids, antihistamines.</li></ul>
			<ul style="list-style-type: none"><li>Chemicals in food – preservatives, artificial sweetening agents, elementary idea of antioxidants.</li></ul>
			<ul style="list-style-type: none"><li>Cleansing agents – soaps and detergents,cleansing action.</li></ul>
November	Revision for PRE BOARD EXAMINATION.		
December	Pre Board Examinations		
January	Practice Test		
Theory Paper 70 marks + Practical Work 30 marks			

## CHEMISTRY

## Practical work: Project File and Viva

Practical Marks: 30 Marks

Exam	Topics
Block Test 1	<b>TITRATION</b>
	1. (i) To prepare standard Mohr's salt solution.
	(ii) To calculate the molarity and strength of $\text{KMnO}_4$ solution by titrating it against supplied standard Mohr's salt solution.
	2. (i) To prepare standard oxalic acid solution.
	(ii) To calculate the molarity and strength of $\text{KMnO}_4$ solution by titrating it against supplied standard oxalic acid solution.
	<b>3. To Identify the acid and basic radicals in the given salt sample.</b>
	(i) Ammonium sulphate, Ammonium bromide.
Pre Board	(ii) Lead nitrate, lead acetate.
	<b>3. To Identify the acid and basic radicals (continued)</b>
	(iii) Aluminium sulphate, Zinc sulphate
	(iv) Calcium acetate, Strontium nitrate, Barium chloride.
	(v) Cobaltic nitrate, Ferric chloride, Nickel sulphate, Manganese chloride.
	<b>4. To Identify the functional group present in the given organic sample.</b>
	(i) Test for unsaturation
	(ii) Carboxylic acid group
	(iii) Alcoholic -OH group, phenolic OH group
	(iv) Aldehydic group
	<b>5. To separate the coloured components of dye by paper chromatography and to calculate their <math>R_f</math></b>
	<b>5. INVESTIGATORY PROJECT</b>
	Any one topic either from lab manual or any other relevant topic based on CBSE syllabus.

## Assessment Criteria

Heading	Marks
Identification of acid and basic radical in the given salt sample	8
Titration	8
Identification of functional group in the organic sample/ content based.	6
Project	4
Lab file + Viva	4
<b>Total</b>	<b>30</b>