TELANGANA STATE BOARD OF INTERMEDIATE EDUCATION: HYDERABAD

ANNUAL ACADEMIC PLAN 2024-25

CHEMISTRY **I YEAR**

Month & No. of working days/No.of periods	Chapter and Topics to be covered	No. of periods allotted for each topic
June 23	Syllabus dictation and discussion of IPE question paper – weightage of marks to each chapter	**01**
	1. ATOMIC STRUCTURE	
	1.1 Sub- atomic particles	
	1.2 Atomic models- Rutherford's nuclear model of atom	
	1.3 Developments to the Bohr's model of atom	
	1.4 Bohr's model for hydrogen atom.	
	1.5 Towards quantum mechanical model of the atom.	**12**
	1.6 Quantum mechanical model of an atom. Important features of quantum mechanical model of atom-orbitals and quantum numbers-shapes of atomic orbitals-energies of orbitals-filling of orbitals in atoms. Aufbau principle, Pauli's exclusion principle and Hund's rule of maximum multiplicity- Electronic configurations of atoms-Stability of half filled and completely filled orbitals.	
	2. CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES	
	2.1 Need to classify elements	**05**
	2.2 Genesis of periodic classification	
	2.3 Modern periodic law and present form of the periodic table	
	EAPCET CLASSES	**04**
	EAPCET – TEST 1	**01**

July 24	2.4 Nomenclature of elements with atomic number greater than100 2.5 Electronic configuration of elements and the periodic table 2.6 Electronic configuration and types of elements s,p,d and f 2.7 Trends in physical properties-periodic trends in chemical properties-Periodic trends and chemical reactivity **3. CHEMICAL BONDING AND MOLECULAR STRUCTURE** 3.1 Kossel – Lewis approach to chemical bonding 3.2 Ionic or electrovalent bond 3.3 Bond Parameters 3.4 The Valence Shell Electron Pair Repulsion (VSEPR) theory. 3.5 Valence bond theory 3.6 Hybridisation 3.7 Coordinate bond 3.8 Molecular orbital theory –bonding in some homonuclear diatomic molecules 3.9 Hydrogen bonding **PRACTICALS: I.** Acquinttance with Laboratory Equipment: 1.Bunsen burner, Spirit Lamp Basic Laboratory equipment (Burette, pipette, conical flask, volumetric flask, measuring, cylinder, wash bottle etc.,) **UNIT TEST - I** **EAPCET CLASSES** **EAPCET – TEST 2**	**06** **12** **01** **04** **01**
August 24	**4. STATES OF MATTER: GASES AND LIQUIDS** 4.1 Intermolecular forces 4.2 Thermal energy 4.3 Intermolecular forces Vs Thermal interactions. 4.4 The gaseous state 4.5 The gas laws 4.6 Ideal gas equation 4.7 Graham's law of diffusion – Dalton's law of partial pressures 4.8 Kinetic molecular theory of gases	**12**

	4.9 Kinetic gas equation of an ideal gas (no derivation)- Deduction of gas laws from kinetic gas equation 4.10 Distribution of molecular speeds – rms, average and most probable speeds-kinetic energy of gas molecules 4.11 Behaviour of real gases – deviation from ideal gas behaviour – compressibility factor Vs pressure diagrams of real gases 4.12 Liquefaction of gases 4.13 Liquid state – properties of liquids in terms of inter molecular interactions – vapour pressure, viscosity and surface tension (Qualitative idea only, no mathematical derivation) **5. STOICHIOMETRY** 5.1 Some basic concepts 5.2 Laws of chemical combinations, Gay Lussac's law of Gaseous volumes, Dalton's atomic theory, Avogadro law 5.3 Atomic and molecular masses- mole concept and molar mass concept of equivalent weight 5.4 Percentage composition of compounds and calculations of empirical and molecular formulae of compounds 5.5 Stoichiometry and stoichiometric calculations 5.6 Methods of expressing concentrations of solutions **PRACTICALS : II.** Basic Laboratory Techniques **UNIT TEST - II** **EAPCET CLASSES** **EAPCET – TEST 3**	**06** **01** **04** **01**
September 22	5.7 Redox reactions 5.8 Oxidation number concept 5.9 Types of redox reactions 5.10 Balancing of redox reactions – oxidation number method-half reaction (ion-electron) method 5.11 Redox reactions in titrimetry	**06**

	6. THERMODYNAMICS 6.1 Thermodynamic terms 6.2 Applications-work-enthalpy-extensive and intensive properties-heat capacity 6.3 Measurement of "U and H": Calorimetry 6.4 Enthalpy change, 'rH' of reactions 6.5 Enthalpies for different types of reactions 6.6 Spontaneity 6.7 Gibbs Energy change and equilibrium 6.8 Absolute entropy and the third law of thermodynamics **Practicals: III.** Purification of Chemical substances **UNIT TEST - III** **EAPCET CLASSES** **EAPCET – TEST 4**	**10** **01** **04** **01**
October 19	**7. CHEMICAL EQUILIBRIUM AND ACIDS-BASES** 7.1 Equilibrium in physical process 7.2 Equilibrium in chemical process – dynamic equilibrium 7.3 Law of chemical equilibrium - law of mass action and equilibrium constant 7.4 Homogeneous equilibria, equilibrium constant in gaseous systems, relationship between Kp and Kc 7.5 Heterogeneous equilibri 7.6 Applications of equilibrium constant 7.7 Relationship between equilibrium constant 'K', reaction Quotient 'Q' and Gibbs energy 'G' 7.8 Factors affecting equilibria,-Le-chatelier's principle application to industrial synthesis of ammonia and sulphur trioxide 7.9 Ionic equilibrium in solutions. 7.10 Acids, bases and salts- Arrhenius, Bronsted-Lowry and Lewis concepts of acids and bases 7.11 Ionisation of acids and bases 7.12 Buffer solutions 7.13 Solubility equilibria of sparingly soluble salts Solubility product constant-common ion effect on solubility of Ionic salts	**10**

	8. HYDROGEN AND ITS COMPOUNDS 8.1 Position of hydrogen in the periodic table 8.2 Dihydrogen-occurance and isotopes 8.3 Preparation of dihydrogen 8.4 Properties of dihydrogen 8.5 Hydrides: Ionic, covalent, and non-stiochiometric hydrides 8.6 Water: Physical properties; structure of water, ice chemical properties of water; hard and soft water temporary and permanent hardness of water 8.7 Hydrogen peroxide: Preparation; physical properties; structure and chemical properties; storage and uses. 8.8 Heavy water 8.9 Hydrogen as a fuel **Practicals:** **IV.** Experiments related to pH change **V.** Chemical equilibrium **VI.** Quantitative estimation (Volumetric analysis) **EAPCET CLASSES** **EAPCET – TEST 5**	**05** **03** **01**
MID TERM HOLIDAYS **FROM 06-10-2024 TO 13-10-2024** **DATE OF RE-OPENING 14-10-2024**		
November 24	**9. s – BLOCK ELEMENTS (ALKALI AND ALKALINE EARTH METALS)** **Group 1 Elements:** 9.1 Alkali metals; Electronic configurations; atomic and ionic radii; ionization enthalpy; hydration enthalpy; physical properties; chemical properties; uses 9.2 General characteristics of the compounds of the alkali metals: oxides; halides; salts of oxy acids 9.3 Anomalous properties of lithium: 9.4 Some important compounds of sodium: Sodium carbonate; sodium chloride; sodium hydroxide; sodium hydrogen carbonate. 9.5 Biological importance of sodium and potassium.	**06**

	Group 2 Elements:	
	9.6 Alkaline earth elements; Electronic configuration; ionization enthalpy; hydration enthalpy; physical properties; chemical properties; uses	
	9.7 General characteristics of compounds of the Alkaline earth metals. oxides, hydroxides, halides, salts of oxyacids (carbonates, sulphates and nitrates)	
	9.8 Anomalous behaviour of beryllium; its diagonal relationship with aluminum	
	9.9 Some important compounds of calcium	
	9.10 Biological importance of calcium and magnesium	
	10. p-BLOCK ELEMENTS GROUP 13 (BORON FAMILY)	
	10.1 General introduction – Electronic configuration, atomic radii, ionization enthalpy, electro negativity; physical & chemical properties	**04**
	10.2 Important trends and anomalous properties of boron	
	10.3 Some important compounds of boron – borax, ortho boric acid, diborane	
	10.4 Uses of boron, aluminium and their compounds	
	11. p-BLOCK ELEMENTS - GROUP 14 (CARBON FAMILY)	
	11.1 General introduction - Electronic configuration, atomic radii, ionization enthalpy, electro negativity; physical & chemical properties	
	11.2 Important trends and anomalous properties of carbon	**05**
	11.3 Allotropes of carbon	
	11.4 Uses of carbon	
	11.5 Some important compounds of carbon and silicon – carbonmonoxide, carbon dioxide, silica, silicones, silicates and zeolites	
	HALF YEARLY EXAMINATIONS	**06**
	FROM 18-11-2024 TO 23-11-2024	
	EAPCET CLASSES	**03**

December 23	**12. ENVIRONMENTAL CHEMISTRY** 12.1 Definition of terms: Air, Water and Soil Pollutions 12.2 Environmental pollution 12.3 Atmospheric pollution 12.4 Acid rain: Particulate pollutants 12.5 Stratospheric pollution 12.6 Water pollution 12.7 Soil Pollution: Pesticides, industrial wastes. 12.8 Strategies to control environmental pollution 12.9 Green chemistry	**05**
	13. ORGANIC CHEMISTRY-SOME BASIC PRINCIPLES AND TECHNIQUES AND HYDROCARBONS 13.1 General introduction 13.2 Tetravalency of Carbon: shapes of organic compounds 13.3 Structural representations of organic compounds 13.4 Classification of organic compounds 13.5 Nomenclature of organic compounds 13.6 Isomerism 13.7 Fundamental concepts in organic reaction mechanisms 13.8 Methods of purification of organic compounds 13.9 Qualitative elemental analysis of organic compounds 13.10 Quantitative elemental analysis of organic compounds	**12**
	Practicals: **VII.** Qualitative Analysis 1.Reactions of the following anions with atleast one confirmatory test for each anion. Carbonate(CO_3^{2-}) Sulphide(S^{2-}),Sulphite(SO_3^{2-}) , Sulphate(SO_4^{2}), Nitrite(NO_2^{-}),Nitrate(NO_3^{-}) Chloride(Cl^{-}) Bromide(Br^{-}), Iodide(I^{-}), Phosphate (PO_4^{3-}), Acetate (CH_3COO^{-})	
	UNIT TEST-IV **EAPCET CLASSES** **EAPCET – TEST 6**	**01** **04** **01**

January 22	**HYDROCARBONS** 13.11 Classification of hydrocarbons 13.12 Alkanes – Nomenclature, isomerism (structural and conformations of ethane only) preparation of alkanes -properties of alkanes 13.13 Alkenes- Nomenclature, structure of ethane, isomerism (structural and geometrical)-methods of preparation of alkenes-properties of alkenes 13.14 **Alkynes** – Nomenclature and isomerism, structure of acetylene methods of preparation of acetylene-physical properties and chemical reactions of alkynes 13.15 **Aromatic Hydrocarbons:** Nomenclature and isomerism structure of benzene, resonance and aromaticity-preparation of benzene physical and chemical properties of benzene-directive influence of functional groups in mono substituted benzene. Carcinogenicity and toxicity **Practicals: VII.** 2. Reactions of the following cations with atleast one confirmatory test for each cation Lead(Pb^{2+}), Copper (Cu^{2+}), Aluminium(Al^{3+}), Ferric(Fe^{3+}),Manganese (Mn^{2+}), Nickle (Ni^{2+}), Zinc(Zn^{2+}),Cobalt(Co^{2+}),Calcium(Ca^{2+}),Strontium(Sr^{2+}), Barium(Ba^{2+}), Magnesium(Mg^{2+}) and Ammonium (NH_4^+) **EAPCET CLASSES** **PRE-FINAL EXAMINATIONS** **FROM 20-01-2025 TO 25-01-2025** **SANKRANTHI HOLIDAYS** **FROM 11-01-2025 TO 16-01-2025**	**12** **04** **06**
February 23	**REVISION**	**23**
March 23	**I.P.E. THEORY EXAMINATIONS** **First Week of March 2025** **LAST WORKING DAY: 29.03.2025**	
	SUMMER VACATION **FROM 30-03-2025 TO 1-06-2025** **Re-Opening of Colleges : 02-06-2025** **ADVANCED SUPPLIMENTARY EXAMINATIONS (IPASE)** **Last week of May 2025**	

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