

COs: Chemistry

B. Sc. Chemistry Paper 1 Inorganic Chemistry

CO1 To study the basics of atomic structure Atomic orbitals, Quantum numbers, Heisenberg uncertainty, Aufbau and Pauli exclusion principles, Hund's multiplicity rule. Electronic configurations of the elements, Bohr's atomic model.

CO2. To understand some periodic properties- atomic and ionic radii, ionization, energy, electron affinity and electro negativity with reference to trends in periodic table and application in predicting chemical behavior.

CO3: To study s and p-block elements.

Paper No. II Organic Chemistry

CO1: To understand the basic concepts in organic chemistry reactions, reagents and mechanisms of organic reactions.

CO2: To study stereochemistry and its importance.

CO3: To familiarize open chain compounds like alkanes, alkenes and aromatic compounds chemistry and their importance

Paper V Physical Chemistry

CO1: To understand basic mathematical concepts logarithmic relations, curve sketching, linear graphs and calculation of slopes, differentiation of functions simple mathematical functions, maxima and minima, partial differentiation.

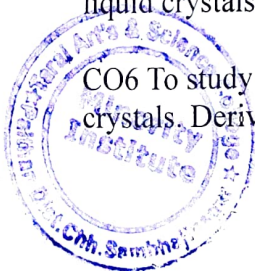
CO2: To understand kinetic theory of gases, kinetic gas equation, and gas laws-Boyles Law, Charles Law, Grahams Law of diffusion, Avogadro's hypothesis, deviation from ideal behavior, van der Waals equation of state.

CO3: Critical Phenomena: PV isotherms of real gases.

CO4. To study chemical kinetics: Factors influencing the rate of reaction, rate law and characteristics of simple chemical reactions zero order, first order, second order, Pseudo order, half-life. Arrhenius equation, concept of activation energy. Catalysis: Definition, types, and characteristics, Enzyme catalysis.

CO5: To understand basics of liquid and solid state Intermolecular forces, structures, liquid crystals Classification, structure of nematic and cholesteric phases.

CO6 To study solids, Miller Indices, laws of crystallography, X-ray diffraction by crystals. Derivation of Bragg equation.




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CO7: To familiarize learners with colloidal state.

Paper VI Inorganic Chemistry-II

CO1. To understand chemical properties of the noble gases, chemistry of xenon, structure and bonding in xenon compounds

CO2. To understand types of bonds- ionic, covalent and coordinate, Hydrogen bonding, Van der Waals forces, Metallic bond Theories of bonding VBT, VSEPR, MOT with formation and shapes of molecules

CO3 To understand the basics of nuclear chemistry Isotopes, Isobars mass, Binding Energy, Packing fraction N/Z ratio, Radio activity, properties of fundamental particles, Artificial transmutation Applications with respect to trans-uranic elements, carbon dating

CD4 To study theory of volumetric analysis Types of titrations, volumetric apparatus, calibration of pipette and burette, indicators used in pH-titrations, oxidizing agents used in titrations. Theory of internal, external and self-indicators for redox titration.

(Organic Chemistry) Paper IX

CO1: To understand structure, reactivity, and methods of preparation and chemical reactions of different types of compounds-alcohols, Phenols, aldehydes-ketones, amines and carboxylic acids.

CO2: To study named reactions-Pinacol-Pinacolone rearrangement, Fries Rearrangement, Claisen Rearrangement, Gatterman Synthesis and Reimer Tiemann Reaction, Baeyer-Villiger Oxidation, Benzoin, Aldol Knoevenagel condensations, Mannich Reactions. Hoffmann Bromamide Reactions, Gattermann Koch synthesis, Heli-Volhard-Zelinsky Reaction. Regents in organic chemistry-LIAIH₄, LTA, PTC.


CO3: To understand the basic functional group transformations, aromatic electrophilic substitution reactions, nucleophilic additions.

Physical Chemistry-1) Paper X

CO1: To understand the basic concepts in thermodynamics.

CO2: To understand the laws of thermodynamics and terms like W, q, du and dh for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process, Hess's law.




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CO3: To study Carnot cycle, its applications, concept of entropy, Gibbs and Helmholtz Functions, Criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change. Variation A with P, V and T.

CO4: To understand equilibrium constant and free energy – law of mass action, Le Chatelier's principle, Reaction isotherm and reaction isochore, Clapeyron equation, Clausius-Clapeyron equation.

(Physical Chemistry 41) Paper XIV

CO1 to study the basic terms and laws Henry law, Raoult's law in phase equilibrium and their applications

CO2 To understand different systems-Water, Pb-Ag, Mg-Zn, FeCl₃-H₂O, phenol water, trimethyl amine water, nicotine water system, acetone-dry ice

CO3 To understand the concept of ideal behavior and deviations from ideality.

CO4 To understand the concept of conductivity and its types, Kohlrausch's law, Arrhenius Theory of Electrolyte Dissociation, Ostwald's dilution law, Transport number: and its determination, Conductometric titrations.

COS To familiarize with types of reversible electrodes, Nernst Equation, Cell E.M.F., single electrode potential, Reference electrodes, Electro-chemical series, Electrolytic and galvanic cells, types of cells, Thermodynamic quantities of cell reactions, Concepts pH, pK_a and their determination, Buffers- types, and mechanism of action, Henderson Hasselbalch equation. Corrosion: Concept, types and electrochemical theory.

Unorganic Chemistry) Paper XIII

CO1 To familiarize students with transition elements, lanthanides and actinides with reference to characteristics, position in periodic table and variation in periodic properties.

CO2: To understand concepts and theories in coordination compounds – Werner's coordination theory, EAN rule, VBT, isomerism, chelates.

CO3: To understand the concepts of acids and bases Arrhenius, Bronsted-Lowry, Lux-Flood, Solvent System and Lewis Concept of Acids and Bases

CO4: To study chemical reaction in non-aqueous solvents.




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Paper XVII Physical Chemistry

CO1. To understand concepts in Quantum Mechanics Black body radiation, Planck's radiation law, photoelectric effect, Bohr's modes of hydrogen atom, Compton Effect. De Broglie Hypothesis, Heisenberg's uncertainty principle, Hamiltonian operator, Schrödinger wave equation postulates of quantum mechanics. Schrödinger wave equation for H-atom.

CO2 To study the basics of spectroscopy Electromagnetic radiation, regions of the spectrum, Born-Oppenheimer approximation, Rotational Spectrum Diatomic molecules, energy levels of a rigid rotor (semi classical principles), selection rule, rotational spectra of rigid diatomic molecule, determination of bond length.

CO3 To understand photochemistry Photochemical processes, laws of photochemistry, Grothuss -Grapper law, Stark Einstein law, Jablonsiki diagram qualitative description of fluorescence, phosphorescence, nonradiative processes, quantum yield and photosensitized reactions.

CO4 To study some physical properties and their relation with the assignment of molecular structure Optical activity, dipole moment, magnetic property. AITK.COM
COS: To introduce nano-materials-Properties, methods of synthesis and applications

CO6. To enable students to solve numerical problems.

Paper XVIII Organic Chemistry

COL: To introduce learners to organic spectroscopy ^1H NMR, shielding and deshielding, chemical shifts, interpretation of PMR spectra of simple organic molecules, combined problems on UV, IR and PMR spectroscopic techniques.

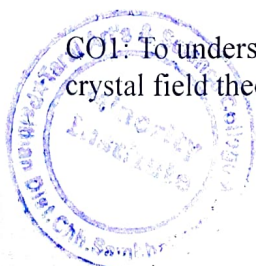
COZ: To familiarize students with organometallic compounds – Structure, methods of synthesis and synthetic applications of Grignard reagents, Organozinc and organolithium compounds.

CO3: To understand organic synthesis via enolates Active methylene compounds, Claisen condensation, Acidity of alpha hydrogen and its synthetic applications.

CO4: To introduce fats, oils and detergents Saponification value, iodine value, and acid value. Detergents preparation of sodium alkyl sulphonate, alkyl benzene sulphonate, and amide sulphonate, cleansing action of detergent.

Paper XIX Organic Chemistry

CO1: To understand nature of metal-ligand bonding in transition metal complexes – crystal field theory with respect to octahedral, tetrahedral and square planer complex.



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CO2: To familiarize with electronic spectra of transition metal complexes.

CO3: To introduce organo metallic compounds classification, nomenclature, synthesis and reactions.

CO4: To study the roles and biological functions of metals in biological systems.

COS: To introduce chromatography-types, classification and applications.

Paper No. XVII Organic Chemistry

CO1: Curriculum benefits to study the heterocyclic compounds in details, their aromatic characters and importance in medicinal chemistry, structure elucidation of five and six member heterocyclic compounds using molecular orbital theory.

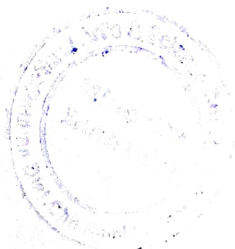
CO2: To understand synthesis and properties of some five and six member heterocyclic compounds.

CO3: To study carbohydrate chemistry and its importance.

CO4: To understand synthesis and properties of some polymers, polymerization reactions.

COS: To know constitution, classification, synthesis and properties of some dyes.

CO6: To understand constitution, classification, synthesis, properties and applications of some drugs.




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