

Sub: - chemistry

class - B.Sc-Ist Year

Exp. No. MANJU KUMARI

Date Jan. 2025

Week - 1

Covalent bond :- Valence bond theory approach
Shapes of simple inorganic molecules and ions
based on VSEPR Theory, Hybridization with

Week - 2

suitable examples of linear, trigonal planar,
Square planar, Tetrahedral, trigonal
bipyramidal and octahedral. π

Week - 3

Molecular orbital theory of homonuclear
and heteronuclear diatomic molecules, dipole
moments & percentage ionic character in
covalent bond.

Week - 4

Ionic solids :- Concept of Ionic structure
(NaCl, CsCl, ZnS, CaF_2), size effects,
radius ratio rule and its limitations, Concept
of lattice energy.

Week - 5

Fajan - Haber cycle, Solvation energy
and its relationship with solubility
of ionic solids, polarizing power &
polarizability of ions, Fajan's rule.

Week - 6

Chemical kinetics :- Concept of reaction rate,
rate equation, Factors affecting rate
Order & Molecularity of a reaction

Week - 7

Integrated rate expression for zero, first,
Half-life period of a reaction, Arrhenius equation

Teacher's Signature

- Week-8 Distribution Law:- Nernst distribution Law, its thermodynamic derivation, Association & dissociation of solute in one of the phases
- Week-9 Determination of degree of hydrolysis and hydrolysis constant of aniline hydrochloride.
- Week-10 Alkanes and cycloalkanes:- Nomenclature, classification, Isomerism, Methods of formation, Name reactions
- Week-11 Physical properties, Mechanism of free-radical halogenation of alkanes, reactivity & selectivity cycloalkanes.
- Week-12 Nomenclature of alkenes, Methods of formation dehydration of alcohols, Hofmann elimination.
- Week-13 Chemical reactions: Electrophilic and free-radical additions, addition of halogens, Hydroboration-oxidation oxymercuration-reduction, Ozonolysis & hydration
- Week-14 Hydrogen bonding:- Definition, types, effects of hydrogen bonding on properties of substances, applications, Vander Waals forces
- Week-15 Metallic bond and Semiconductors:-
 Metallic bond:- Qualitative idea of Valence bond and Band theories of Metallic bond
 Semiconductors:- Introduction, types & applications

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week-1	Lanthanides :- Electronic structure, oxidation States & Ionic radii & Lanthanide Contraction, Lanthanide compounds,
week-2	Actinides :- Chemistry of Actinides, Comparison of properties of Lanthanides & Actinides
week-3	Theory of qualitative & quantitative Inorganic analysis - I
week-4	Theory of qualitative & quantitative Inorganic Analysis - II
week-5	Thermodynamics - III
week-6	Thermodynamics - IV
week-7	Electrochemistry - III :- Electrolytic & Galvanic cells - reversible & irreversible cell, conventional representation of electrochemical cell, EMF & its measurement.
week-8	Types of reversible electrodes :- Metal-metal ion, gas electrode, Nernst equation, SHE, Electrochemical series & application.
week-9	Electrochemistry - IV
week-10	Infrared (IR) absorption spectroscopy.
week-11	Amines

Week - 12 — Diazonium salts.

Week - 13 — Nitro compounds.

Week - 14 — Aldehydes & Ketones
Nomenclature & structure of the
Carbonyl group, Synthesis of aldehydes
& Ketones.

Week - 15 — Physical properties & chemical
reactions of aldehydes, Perkin and
Knoevenagel condensations, Condensation
with ammonia & its derivatives, Wittig
reactions, Mannich reactions, Cannizzaro
reactions, MPV, Clemmensen, Wolff-
Kishner, LiAlH_4 & NaBH_4 reductions.