1. Atomic Structure
Bohr's atomic model-Sommerfeld's extension of atomic structure; Electronic configuration and Quantum numbers; Shapes of s,p,d,f orbitals - Pauli’s exclusion principle - Hund’s Rule of maximum multiplicity- Aufbau principle. Emission and absorption spectra, line and band spectra; Hydrogen spectrum – Lyman, Balmer, Paschen, Brackett and Pfund series; deBroglie’s theory; Heisenberg’s uncertainty principle – wave nature of electron – Schrodinger wave equation (No derivation). Eigen values and eigen functions. Hybridization of atomic orbitals involving s, p and d orbitals

2. p, d and f – Block Elements
p-block elements – Phosphorous compounds; PCl₃, PCl₅ – Oxides. Hydrogen halides, Inter halogen compounds. Xenon fluoride compounds. General Characteristics of d – block elements – Electronic Configuration – Oxidation states of first row transition elements and their colours. Occurrence and principles of extraction: Copper, Silver, Gold and Zinc. Preparation and properties of CuSO₄, AgNO₃ and K₂Cr₂O₇.

Lanthanides – Introduction, electronic configuration, general characteristics, oxidation state – lanthanide contraction, uses, brief comparison of Lanthanides and Actinides.

3. Coordination Chemistry and Solid State Chemistry


4. Thermodynamics, Chemical Equilibrium and Chemical Kinetics
I and II law of thermodynamics – spontaneous and non spontaneous processes, entropy, Gibb's free energy – Free energy change and chemical equilibrium – significance of entropy. Law of mass action – Le Chatlier’s principle, applications of chemical equilibrium. Rate expression, order and molecularity of reactions, zero order, first order and pseudo first order reaction – half life period. Determination of rate constant and order of reaction. Temperature dependence of rate constant – Arrhenius equation and activation energy.
5. Electrochemistry


6. Isomerism in Organic Compounds


7. Alcohols and Ethers


8. Carbonyl Compounds


9. Carboxylic Acids and their derivatives

10. Organic Nitrogen Compounds and Biomolecules


Carbohydrates – Distinction between sugars and non sugars, structural formulae of glucose, fructose and sucrose, with their linkages, invert sugar – definition, examples of oligo and polysaccharides,

Amino acids – Classification with examples, Peptides-properties of peptide bond,

Lipids - Definition, classification with examples, difference between fats, oils and waxes.

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