Inorganic Chemistry-I (M = 35)

Unit 1 (M = **20)**

Extra-nuclear Structure of atoms
Bohr's theory for hydrogen atom (simple mathematical treatment), atomic spectra of hydrogen and Bohr's model, quantum numbers and their significance, Pauli's exclusion principle, Hund's rule, electronic configuration of many-electron atoms, *Aujbau* principle and its limitations.

Radioactivity
Natural radioactivity, units, radioactive disintegration series, group displacement law, law of radioactive decay, half-life of radio elements. Stability of atomic nucleus: *nip* ratio, nuclear binding energy, mass defect. Nuclear reactions: fission, fusion, transmutation of elements, artificial radioactivity, measurement ofradiactivity (simple idea).

Chemical Periodicity
classification of elements on the basis of electronic configuration: general characteristics ofs-, p-, d- and f-block elements. Positions of hydrogen and noble gases. Atomic and ionic radii, ionization potential, electron affinity, and electronegativity; periodic and group-wise variation of above properties in respect of s- and p- block elements.

Unit 2 (M = 15)

Ionic bonding
General characteristics of ionic compounds, sizes of ions, radius ratio rule and its limitation. Lattice energy, Born Haber cycle.

Covalent bonding
General characteristics of covalent compounds, valence-bond approach, hybridization involving s-, p-, d-orbitals,Valence Shell Electron Pair Repulsion (VSEPR) concept, shapes of simple molecules and ions of main group elements, bond moment and dipole moment, partial ionic character of covalent bonds, Fajan's rules, hydrogen bonding and its effect on physical and chemical properties.

Coordinate bonds and Coordination compounds

Complex salts and double salts, Warner's theory of coordination, IUPAC nomenclature of coordination complexes (mononuclear complexes only), chelate complexes, stereochemistry of coordination numbers 4 and 6.

Inorganic Practical-I (M = 15)

Qualitative analysis

Detection of three radicals in a mixture by preliminary and wet tests.

Cation radicals: Cu2+, A_s3+, Fe^{2} +/3+, Cr3+, AIl+, Mn2+, NF+, C02+, Ca^{2}+ Ba^{2}+ Na+ K+ NH +

Anion radicals: CI-, Br-, 1-, $N0_3$', sot, s.o,'. *pot,* BO/" CrO 2 AsO 3·
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