MJD Govt. College Taranagar (Churu)

Department of Chemistry

B.Sc.-I (Syllabus)

INORGANIC CHEMISTRY

PAPER-I

Unit-I

(a) Atomic Structure :

Idea of De-Broglie matter/waves, Heisenberg uncertainty principle, atomic orbitals, Schrodinger wave equation, significance of psi and psi*, quantum numbes, radial and angular
wave function and probability distribution curves, shapes of s, p,d orbitals. Aufbau and Pauli
exclusion principles, Hund's multiplicity rule. Electronic configurations of the elements, effective nuclear charge.

(b) Periodic Properties :

Atomic and ionic radii, ionization energy, electron affinity and electronegativity, different, methods of determination, trends in periodic table and applications in predicting and explaining the chemical behavior.

Unit-II

(a) Chemical Bonding :

Covalent Bond - Valence bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and
ions. Valence shell electron pair repulsion (VESPR) theory to NH3, H3O+, SF4, CIF3, ICI2-
and H2O.

(b) MO theory-Homonuclear and heteronuclear (CO and NO) diatomic molecules, multicentre bonding in electron deficient molecules, bond strength and bond energy, percentage ionic character from dipole moment and electronegativity difference.

Unit-III

(a) Ionic Solids - Ionic Structures, radius ratio effect and coordination number, limitation of
radius ratio rule, lattice defects, semiconductors, lattice energy and Born-Haber Cycle,

solvation energy and solubility of ionic solids, polarizaing power and polarizability of ions.
Fajan's rule. Metallic bond - Free electron, valence bond and band theories.

(*b*) Weak interaction-Hydrogen bonding, Vander waals forces.

Unit-IV

(a) ***s- Block Elements*** - Comparative study, diagonal relationship, salient features of hydrides,
solvation and complexation tendencies including their function in biosystems and introduction
to alkyls and aryls.

(*b*) *Chemistry of Noble Gases*-Chemical properties of the noble gases, chemistry of xenon,
structure and bonding in xenon compounds.

(*c*) *p-Block elements*-Comparative study (Including diagonal relationship) of groups13-17
elements, compounds like hydrides, oxides, oxyacids and halides of groups 13-17.

Unit-V

Chemistry of the following Compounds : Hydrides of Boron, diborane and higher boranes,
borazine, fullerenes, carbides, flurocarbons, silicates, tetrasulphur tetranitride, basic properties of halogens, interhalogens and polyhalides.