

Lesson plan 2021-22

Name:- Manjeet

B.SC.-I (SEMESTER-I): CHEMISTRY

INORGANIC CHEMISTRY (THEORY)

[Paper-1]

Time: 3 Hours

Max. Marks: 30

(22-30 October)

SECTION-A

Atomic Structure: Idea of de-Broglie matter waves, Heisenberg's uncertainty principle, atomic orbitals, quantum numbers, radial and angular wave functions

(1-15 November)

probability distribution curves, shapes of s, p, d orbitals.

Periodic Properties: General principles of periodic table: Aufbau and Pauli exclusion principles, Hund's multiplicity rule.

(16-30 November)

Electronic configuration of the elements, effective nuclear charge, Slater's rules.

Atomic and ionic radii, ionization energy, electron affinity and electronegativity- definition, methods of determination or evaluation, trends in periodic table (in s and p block elements.)

(01-15 December)

#### SECTION-C

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 (BeF<sub>2</sub>, BF<sub>3</sub>, CH<sub>4</sub>, PF<sub>5</sub>, SF<sub>6</sub>, IF<sub>7</sub>, SO<sub>2</sub>, ClO<sub>2</sub>,-) Valence shell electron pair repulsion (VSEPR) theory of NH<sub>3</sub>, H<sub>2</sub>O, SF<sub>6</sub>, ClF<sub>3</sub>, ICl<sub>3</sub>, and H<sub>2</sub>O. MO theory of heteronuclear (CO and NO) diatomic molecules, bond strength and bond energy, percentage ionic character from dipole and electronegativity difference.

(16Dec. -10 Jan)

#### SECTION-D

Ionic Solids: Ionic structure (NaCl, CsCl, ZnS (Zinc Blende), CaF<sub>2</sub>) radius ratio effect and coordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy (mathematical derivation excluded) and Born-Haber cycle, solvation energy and its relation with solubility of ionic solids, polarizing power and polarisability of ions, Fajan's rule.

Ch Bansilal Govt College Loharu Bhiwani

Lesson plan 21-22

Name:- Manjeet

B.SC.-II (SEMESTER-IV): CHEMISTRY

INORGANIC CHEMISTRY

( 21-30 April)

SECTION-A

Chemistry off-block elements Lanthanides

Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, lanthanide compounds.

(1-15 May)

SECTION-B

Chemistry of f - block elements

Actinides

General features and chemistry of actinides, chemistry of separation of Np, Pu and Am from U

(16-30 May)

Comparison of properties of lanthanides and actinides and with transition elements.

SECTION-C

Theory of Qualitative and Quantitative Inorganic Analysis-I

Chemistry of analysis of various acidic radicals

(1-15 June)

Chemistry of identification of acid radicals in typical combinations, Chemistry of interference of acid radicals including their removal in the analysis of basic radicals.

(16-30 June)

SECTION-D

Theory of Qualitative and Quantitative Inorganic Analysis-II

Chemistry of analysis of various groups of basic radicals

Theory of precipitation, co-precipitation, Post-precipitation, purification of precipitates.

Ch Bansilal Govt College Loharu (Bhiwani)

Lesson plan 21-22

Name Manjeet

B.Sc.-3rd YEAR (SEMESTER-6): CHEMISTRY

INORGANIC CHEMISTRY (THEORY) [Paper-I]

(21- 30 April)

SECTION-A

Organometallic Chemistry: Definition, nomenclature and classification of organometallic compounds.

( 1-15 May)

Preparation, properties, and bonding of alkyls of Li, Al, Hg, and Sn a brief account of metal-ethylenic complexes,

mononuclear carbonyls and the nature of bonding in metal carbonyls.

( 16-30 May)

SECTION-B

Acids and Bases, HSAB Concept: Arrhenius, Bronsted - Lowry, the Lux - Flood, Solvent system and Lewis concepts of acids & bases, relative strength of acids & bases,

(1-15 June)

Concept of Hard and Soft Acids & Bases, Concept of Hard and Soft Acids & Bases. Symbiosis, electronegativity and hardness and softness.

Ch. Bansilal Govt College loharu ( Bhiwani)

Lesson plan 2021-2022

Name:- Manjeet

Semester-III

COORDINATION CHEMISTRY AND CHEMICAL KINETICS

(Theory)

(22-30 October)

UNIT-I

Coordination Chemistry-I: Werner's theory of coordination compounds, nomenclature of coordination compounds, Isomerism in coordination compounds, valence bond theory of transition metal complexes, and its limitations.

(01-15 November)

Crystal field theory, crystal field splitting in octahedral, tetrahedral and square planar complexes, factors affecting the crystal field splitting.

(16-30 November)

UNIT-II

Coordination Chemistry-II: Types of magnetic behaviour, methods of determining magnetic susceptibility, spin-only formula. L-S coupling, orbital contribution to magnetic moments, application of magnetic moment data for 3d-metal complexes,

(01-15 December)

Types of electronic transitions, selection rules for d-d transitions, spectroscopic ground states, spectrochemical series, Orgel- energy level diagram for d<sup>1</sup> and d<sup>1</sup> states, discussion of the electronic spectrum of [Ti(H<sub>2</sub>O)<sub>6</sub>]<sup>3+</sup> complex ion.

(16-30 December)

#### UNIT-III

Kinetics-I: Rate of reaction, rate equation, factors influencing the rate of a reaction: concentration, temperature, pressure, solvent, light, catalyst. Order of a reaction, integrated rate expression for zero order, first order, second and third order reaction. Half-life period of a reaction.

(01-15 January)

Methods of determination of order of reaction, Consecutive Reaction, Series reaction, Parallel reactions (Elementary idea).

(16-31 January)

#### UNIT-IV

Kinetics-II: Effect of temperature on the rate of reaction - Arrhenius equation. Theories of reaction rate Simple collision theory for unimolecular reaction, Transition state theory, Enzymatic reaction: Michaelis - Menton treatment, Acid-Base Catalysed reactions.