VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.

F. Y. B.Sc. Chemistry - Paper – I Semester- I

Effective from June 2014

Inorganic and Physical Chemistry **Total Hrs. 30**

UNIT I : SOLID STATE **10 Hrs.**

Definition of space lattice, unit cell, difference between crystalline and amorphous state, types of crystals with illustrations, law of crystallography. Steno's law and laws of symmetry, lattice planes, Miller indices, Bravais indices, type of cubic systems, diagrammatic representation of cubic systems and d_{100},d_{110} and d_{111} planes, Bragg's equation (X-ray diffraction), Crystal structure of NaCl, KCl.

UNIT II :
(A) NOBLE GASES **6 Hrs.**

Chemistry of noble gases, chemistry of xenon, structure and bonding in xenon compounds.

(B) VANADIUM **4 Hrs.**

Extraction of Vanadium from carnotite and patronite ores, its properties and uses, Preparation and uses of V_2O_5.

UNIT III CHEMICAL KINETICS **5 Hrs.**

A. Chemical kinetics and its scope, rate of reaction, factors affecting rate of reaction: temperature, concentration, pressure, solvent, light and catalyst, Molecularity of reaction, Classification of chemical reaction, Order of reaction with illustration (first order, second order, third order, zero order, pseudo first order) reaction, : Second order (a=b), half life and mean life.

B **PERIODIC PROPERTIES** **5 Hrs.**
Definition of atomic and ionic radii, ionization energy, electron affinity and electron negativity, S block elements : Comparative study, diagonal relationship, sahent features of hydrides, solvation and complexation and tendencies including their function in biosystems.

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Paper – II Semester- I **Effective from June 2014**

Organic Chemistry **Total Hrs. 30**

Unit I : (A) Empirical formula . Molecular formula , and Structural formula: 7 Hrs. .

Determination of empirical formula and its relation with molecular formula determination of molecular weight of (a) organic acid by titration and silver salt method and (b) organic base by chioroplatinate method and its limitations . Determination of molecular formula of gaseous Hydrocarbons by Explosion method , Numerical example.

(B) Polynuclear Hydrocarbons : 3 Hrs.

Classification aromaticity and synthesis of industrial preparation , properties uses and canonical structures of Napthalene , Anthracene and Phenanthene.

UNIT II : Stereochemistry 10 Hrs.

(a) Isomerism :- Optical activity , Chiral and achiral molecules,
(b) Optical isomerism of tartaric acid, Enantiomers, diastereomers (Threo & Erythro), Meso compounds Resolution of Enantiomers, inversion retention and racemization .
(c) Geometrical Isomerism: Alkene derivative & oximes E & Z system of nomenclature .
(d) Relative and absolute configuration, sequence rules. D & Land R & S system of nomenclature.

UNIT III (A) Alkanes and Cycloakanes : 5 Hrs.

(a) Alkanes : nomenclature, sources, methods of formation with special reference to Wurtz reaction, Kolbe reaction and decarboxylation of carboxylic acids. Physical properties and chemical reactions.
(b) Cycloalkanes : nomenclature, methods of fonnation chemical reactions, Baeyer's strain theory and its limitations, Theory of strainless ring.

(B) Heterocyclic compounds : 5 Hrs.

Nomenclature aromaticity , and synthesis properties uses and canonicai structures of Pyridine, Pyrrol, uran , Thiophene .

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F. Y. B.Sc. Chemistry Practical Semester- I

Effective from June 2014

INORGANIC QUALITATIVE ANALYSIS

LIST OF INORGANIC CHEMICALS

CHLORIDES- Cu^{+2}, Fe^{+3}, Mn^{+2}, Co^{+2}, Ni^{+2}, Ca^{+2}, Ba^{+2}, Sr^{+2}, Na^{+1}, K^{+1}, NH_4^{+1}.

BROMIDES- Sr^{+2}, Na^{+1}, K^{+1}, NH_4^{+1}.

IODIDE – K^{+1}

NITRATE – Pb^{+2}, Co^{+2}, Ni^{+2}, Ba^{+2}, Sr^{+2}, Na^{+1}, K^{+1}, NH_4^{+1}

SULPHIDE – $Zn^{+2,}$ Sb^{+3}

SULPHATE – Cu^{+2}, Al^{+3}, Fe^{+2}, Zn^{+2}, Mn^{+2}, Co^{+2}, Ni^{+2}, Mg^{+2}, Na^{+1}, K^{+1}, NH_4^{+1}

CHROMATE – Na^{+1}, K^{+1}

CARBONATE – Cu^{+2}, Zn^{+2}, Mn^{+2}, Co^{+2}, Ni^{+2}, Ca^{+2}, Ba^{+2}, Sr^{+2}, Mg^{+2}, Na^{+1}, K^{+1}, NH_4^{+1}

PHOSPHATE - Cu^{+2}, Al^{+3}, Fe^{+3}, Zn^{+2}, Mn^{+2}, Ca^{+2}, Ba^{+2}, Sr^{+2}, Mg^{+2}, Na^{+1}, K^{+1}, NH_4^{+1}

OXIDE – As^{+3}, Sb^{+3}, Zn^{+2}

N. B. Candidate should perform the analysis of at least 8 compounds.

2. ACID BASE TITRATION

HNO_3	**NaOH**	**$H_2C_2O_4, 2H_2O$**
H_2SO_4	**$NaHCO_3$**	**HNO_3**
$NaOH + Na_2CO_3$	**HCI**	
$Na_2CO_3 + NaHCO_3$	**H_2SO_4**	

N.B. Candidate should perform at least 2 volumetric exercise

3. PREPARATIO OF STANDARD SOLUTION OF FOLLOWING. (Demonstration Practical)

1. **NaOH**
2. **Succinic Acid**
3. **$KMnO_4$**