

LESSON PLAN  
CLASS - BSc II Sem

8

B. Sc IInd Semester

Paper V (Theory) Inorganic Chemistry  
CH-201

Max. Marks: 30  
Time: 3 Hrs.

**Note:** Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing six short answer type questions covering the entire syllabus and will be of six marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be of six marks each

Section-A

( March 2022 )

**.Hydrogen Bonding & Vander Waals Forces**

Hydrogen Bonding – Definition, Types, effects of hydrogen bonding on properties of substances, application Brief discussion of various types of Vander Waals Forces

**. Metallic Bond and Semiconductors**

Metallic Bond- Brief introduction to metallic bond, band theory of metallic bond  
Semiconductors- Introduction, types and applications.

Section-B

( April - 2022 )

**. s-Block Elements**

Comparative study of the elements including , diagonal relationships, salient features of hydrides (methods of preparation excluded), solvation and complexation tendencies including their function in biosystems.

**Chemistry of Noble Gases** Chemical properties of the noble gases with emphasis on their low chemical reactivity, chemistry of xenon, structure and bonding of fluorides, oxides & oxyfluorides of xenon.

SECTION - C

( May 2022 )

**p-Block Elements**

Emphasis on comparative study of properties of p-block elements (including diagonal relationship and excluding methods of preparation).

**Boron family (13<sup>th</sup> gp):-**

Diborane – properties and structure (as an example of electron – deficient compound and multicentre bonding), Borazene – chemical properties and structure Trihalides of Boron – Trends in Lewis acid character structure of aluminium (III) chloride.

**Carbon Family (14<sup>th</sup> group)**

Catenation, p  $\pi$ - d  $\pi$  bonding (an idea), carbides, fluorocarbons, silicates structural aspects), silicons – general methods of preparations, properties and uses.

## SECTION-D

(JUNE 2022)

**Nitrogen Family (15<sup>th</sup> group)**

Oxides – structures of oxides of N,P. oxyacids – structure and relative acid strengths of oxyacids of Nitrogen and phosphorus. Structure of white, yellow and red phosphorus.

**Oxygen Family (16<sup>th</sup> group)**

Oxyacids of sulphur – structures and acidic strength  $H_2O_2$  – structure, properties and uses.

**Halogen Family (17<sup>th</sup> group)**

Basic properties of halogen, interhalogens types properties, hydro and oxyacids of chlorine – structure and comparison of acid strength.

**B. Sc. IInd Semester**

Paper VI (Theory) Physical Chemistry

Marks: 29

CH-202

Time: 3 Hrs.

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## Section – A

(APRIL 2022)

**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. Methods of determination of order of reaction.

## Section – B

(APRIL 2022)

**Kinetics-II**

Effect of temperature on the rate of reaction – Arrhenius equation. Theories of reaction rate – Simple collision theory for unimolecular and bimolecular collision. Transition state theory of Bimolecular reactions.

## Section-C

(MAY - 2022)

**Electrochemistry-I**

Electrolytic conduction, factors affecting electrolytic conduction, specific, conductance, molar conductance, equivalent conductance and relation among them, their variation with concentration. Arrhenius theory of ionization, Ostwald's Dilution Law. Debye-Huckel - Onsager's equation for strong electrolytes (elementary treatment only) Transport number, definition and determination by Hittorf's methods, (numerical included)

## Section-D

(JUNE 2022)

**Electrochemistry-II**

Kohlrausch's Law, calculation of molar ionic conductance and effect of viscosity temperature & pressure on it. Application of Kohlrausch's Law in calculation of conductance of weak electrolytes at infinite dilution. Applications of conductivity measurements: determination of degree of dissociation, determination of  $K_a$  of acids determination of solubility product of sparingly soluble salts, conductometric titrations. Definition of pH and  $pK_a$ , Buffer solution, Buffer action, Henderson - Hazel equation, Buffer mechanism of buffer action.

**B. Sc IInd Semester****Paper VII (Theory) Organic Chemistry****Max. Marks: 29****CH-203****Time: 3 Hrs.**

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## Section-A

(APRIL 2022)

**.Alkenes**

Nomenclature of alkenes, mechanisms of dehydration of alcohols and dehydrohalogenation of alkyl halides. The Saytzeff rule, Hofmann elimination, physical properties and relative stabilities of alkenes. Chemical reactions of alkenes  
 □ mechanisms involved in hydrogenation, electrophilic and free radical additions, Markownikoff's rule, hydroboration-oxidation, oxymercuration-reduction, ozonolysis, hydration, hydroxylation and oxidation with  $KMnO_4$ ,

## Section-B

(MAY 2022)

**Arenes and Aromaticity**

Nomenclature of benzene derivatives: Aromatic nucleus and side chain. Aromaticity: the Huckel rule, aromatic ions, annulenes up to 10 carbon atoms, aromatic, anti - aromatic and non - aromatic compounds. Aromatic electrophilic substitution  $\square$  general pattern of the mechanism, mechanism of nitration, halogenation, sulphonation, and Friedel-Crafts reaction. Energy profile diagrams. Activating, deactivating substituents and orientation.

## Section-C

(JUNE 2022)

**Dienes and Alkynes**

Nomenclature and classification of dienes: isolated, conjugated and cumulated dienes. Structure of butadiene. Chemical reactions  $\square$  1,2 and 1,4 additions (Electrophilic & free radical mechanism), Diels-Alder reaction, Nomenclature, structure and bonding in alkynes. Methods of formation. Chemical reactions of alkynes, acidity of alkynes. Mechanism of electrophilic and nucleophilic addition reactions, hydroboration-oxidation of alkynes

## Section-D

(JULY 2022)

**Alkyl and Aryl Halides**

Nomenclature and classes of alkyl halides, methods of formation, chemical reactions. Mechanisms and stereochemistry of nucleophilic substitution reactions of alkyl halides,  $S_N2$  and  $S_N1$  reactions with energy profile diagrams. Methods of formation and reactions of aryl halides, The addition-elimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions. Relative reactivities of alkyl halides vs allyl, vinyl and aryl halides.

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