Government PG College for Women, Rohtak

Department of Chemistry Odd semester Lesson Plans 2024

Government PG College for Women, Rohtak

Department of Chemistry Session: 2024-2025

Lesson Plan Semester - V

Name of Faculty : Dr. Anita Singhal

Subject : Inorganic Chemistry
B.Sc. III

Section – A, C & D

July 2024

Fourth week **Unit I- Metal Ligand Bonding in Transition Metal Complexes**
Limitations of valence bond theory.

August 2024

Inorganic
First week- An elementary idea of crystal field theory.Crystal field splitting in octahedral complexes.
Second week - Crystal field splitting in tetrahedral and square planar complexes.
Third week – Factors affecting crystal field parameters. (Assignment)
Fourth week – **Unit II - Thermodynamic & Kinetic aspects of Metal Complexes**
A brief outline of thermodynamic stability of metal complexes.

September 2024

Inorganic
First week- Factors affecting the stability of metal complexes.
Second week - Substitution reactions in Square planar complexes of Pt(II)
Third week – Trans effect and Assignment
Fourth week – **Unit – III Magnetic Properties of Transition Metal Complexes**
Types of magnetic behaviour, methods of determining magnetic susceptibility

October 2024

Inorganic
First week- Spin only formula.
Second week- LS coupling, correlation of μ_s and μ_{eff} values. Orbital contribution to magnetic moments. Application of magnetic moment data for 3d- metal complexes.

Third week – Revision of Unit –III. (Test)

Unit- IV Electronic Spectra of Transition Metal complexes
Types of electronic transitions, selection rules for d-d transitions, spectroscopic ground states.
Fourth week – Spectrochemical series. orgel- energy level diagram of d^1-d^9 states.

November 2024

Inorganic

First week- Diwali Break

Second week- Discussion of electronic spectrum of $[Ti(H_2O)_6]^{3+}$ complex ion.

Third week – Revision &Problem solving

Government College for Women, Rohtak

Department of Chemistry

Lesson Plan, Odd Semester (Session 2024-25)

Name of Extension Lecturer: **Dr. Aarti Dalal (3024)**

B.Sc.1st Sem (MDC.) Section – **C**

B.Sc.3rd Sem (N.M.) Section – **A**

B.Sc.5th Sem (Med.) Section – **B**

Subject - **Organic and Inorganic Chemistry**

July, 2024

Fourth Week --

BSc. 1st: Introduction of Proteins, Physical properties of Amino Acids.

B.Sc.3rd Nomenclature of Phenols.

B.Sc.5th Metal ligand bonding in Transition Metal Complexes.

Fifth Week --

BSc. 1st: Essential and Nonessential Amino Acids.

B.Sc.3rd Structure and Bonding of phenols.

B.Sc.5th An elementary idea of Valence Bond Theory and Limitation of Valence Bond Theory.

August, 2024

First Week –

BSc. 1st: Peptide bond, General properties of proteins.

B.Sc.3rd Preparation of Phenols.

B.Sc.5th An elementary idea of Crystal field theory (CFT).

Second Week –

BSc. 1st: Simple, Conjugated and derived Proteins.

B.Sc.3rd Physical Properties and acidic Character of Phenols.

B.Sc.5th Crystal field splitting in Octahedral Complexes.

Third Week --

BSc. 1st: Nutritional classification of proteins.

B.Sc.3rd Comparative acidic strengths of alcohols and phenols.

B.Sc.5th Crystal field splitting in Tetrahedral and Square planar complexes.

Fourth Week –

BSc. 1st: Organizations of proteins structure into Primary Structure.

B.Sc.3rd Resonance stabilization of Phenoxide ion.

B.Sc.5th Factors affecting crystal field parameters.

Fifth week --

BSc. 1st: Organizations of proteins structure into Secondary Structure.

B.Sc.3rd Chemical Reactions of phenols.

B.Sc.5th Revision and Group Discussion class.

September, 2024

First Week –

BSc. 1st: Organizations of proteins structure into Tertiary Structure.

B.Sc.3rd Electrophilic Aromatic Substitution (EAS) Reaction.

B.Sc.5th Test and assignment of "Metal ligand bonding in Transition Metal Complexes".

Second Week –

BSc. 1st: Organizations of proteins structure into Quaternary Structure.

B.Sc.3rd Mechanism of Fries Rearrangement.

B.Sc.5th Thermodynamic and Kinetic Aspects of Metal complexes.

Third Week --

BSc. 1st: Biological Functions of Proteins.

B.Sc.3rd Claisen Rearrangement.

B.Sc.5th Thermodynamic Stability, Substitution Reactions of Square Planar Complexes of Pt(II).

Fourth Week –

BSc. 1st: Revision & Group Discussion Class of Proteins.

B.Sc.3rd Reimer-Tiemann Reaction.

B.Sc.5th Magnetic Properties of transition Metal Complexes, Types of Magnetic Behaviour.

Fifth week --

BSc. 1st: Test and Assignment of Protein.

B.Sc.3rd Mechanism of Reimer-Tiemann Reaction.

B.Sc.5th Methods of determining magnetic susceptibility, Spin only formula. L-S coupling.

October, 2024 (27Oct -03Nov Diwali Vacation)

First Week –

BSc. 1st: Introduction of Nucleic Acid.

B.Sc.3rd Kolbes Reaction

B.Sc.5th Correlation of magnetic values, Orbital contribution to Magnetic Moments.

Second Week –

BSc. 1st: Nucleosides and their structures.

B.Sc.3rd Mechanism of Kolbes Reaction

B.Sc.5th Application of Magnetic Moments data for 3d-metals complexes.

Third Week --

BSc. 1st: Nucleotides and their structures.

B.Sc.3rd Schotten and Baumann Reactions.

B.Sc.5th Test and Group Discussion.

Fourth Week –

BSc. 1st: Purines and Pyrimidine's.

B.Sc.3rd Mechanism of Schotten and Baumann Reactions.

B.Sc.5th Introduction of "Electron Spectra of Transition Metal Complexes".

Fifth week -- Diwali Vacation

November, 2024

First Week – **Diwali Vacation**

Second Week –

BSc. 1st: Revision of Nucleic Acid.

B.Sc.3rd Revision of Phenol

B.Sc.5th Tpes of Electronic Transitions, Spectroscopic Grounds States, Spectrochemical Series.

Third Week --

BSc. 1st: Group Discussion of Nucleic Acid.

B.Sc.3rd Group Discussion Class of Phenol.

B.Sc.5th Orgel energy level diagram of d^1 and d^9 states.

Fourth Week –

BSc. 1st: Test and Assignment of Nucleic Acid.

B.Sc.3rd Test and Assignment of Phenols.

B.Sc.5th Discussion of the electronic spectra of $[Ti(H_2O)_6]^{3+}$ Complex ion. Test and Viva.

Government PG College for Women, Rohtak

Department of Chemistry Session: 2024-2025

Lesson Plan Semester - 3rd & 1st

Name of Faculty : Dr. Suman (Ext. Lect.) (MIS-2954)

B. Sc. - II (Medical & Nonmedical)

Subject : Organic & Physical Chemistry
Section – A (Organic & Physical) & Section – C (Physical)
B Sc. - I Subject : Biochemistry Section – B & C

July 2024

Fourth week

B Sc. - II & Sec - A (Physical)

Definition of thermodynamic terms: system,surrounding etc. Types of systems, intensive and extensive properties. State and path functions and their differentials.

B Sc. - II & Sec - C (Physical) Thermodynamics-I

Definition of thermodynamic terms: system,surrounding etc. Types of systems, intensive and extensive properties. State and path functions and their differentials.

August 2024

First week

B Sc. - II & Sec - A (Physical)

Thermodynamic process. Concept of heat and work. Zeroth Law of thermodynamics, First law of thermodynamics: statements.

B Sc. - II & Sec - C (Physical)

Thermodynamic process. Concept of heat and work. Zeroth Law of thermodynamics, First law of thermodynamics: statements.

B Sc. - I & Sec - C (Biochemistry) Section B Carbohydrates

Definition, sources, Functions and classification.

Second week

B Sc. - II & Sec - A (Physical)

Definition of internal energy and enthalpy, Heat capacity, heat capacities at constant volume and pressure and their relationship.

B Sc. - II & Sec - C (Physical)

Definition of internal energy and enthalpy, Heat capacity, heat capacities at constant volume and pressure and their relationship.

B Sc. - I & Sec - C (Biochemistry)

Structure, properties and Functions of Monosaccharides, Important disaccharides.

Third week

B Sc. - II & Sec - A (Physical)

Joule's law – Joule – Thomson coefficient for ideal gass and real gas: and inversion temperature. **(Assignment)**

B Sc. - II & Sec - C (Physical)

Joule's law – Joule – Thomson coefficient for ideal gass and real gas: and inversion temperature. **(Assignment)**

B Sc. - I & Sec - C (Biochemistry)

Composition and functions of important homopolysaccharides, physiological actions of unavailable carbohydrates (dietary fibres). **(Assignment)**

Fourth week

B Sc. - II & Sec - A (Physical) SECTION – B Thermodynamics-II

Calculation of w, q for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process, Temperature dependence of enthalpy, Kirchoffs equation. Bond energies and applications of bond energies.

B Sc. - II & Sec - C (Physical) SECTION – C Thermodynamics-II

Calculation of w, q for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process.

B Sc. - I & Sec - B (Biochemistry) Section B Carbohydrates

Definition, sources, Functions and classification.

B Sc. - I & Sec - C (Biochemistry)

Lipids Introduction, classification and functions, saturated and unsaturated fatty acids.

October 2024

First week

B Sc. - II & Sec - A (Organic) Section A Alcohols

Monohydric alcohols nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids and esters. Hydrogen bonding. Acidic nature.

B Sc. - II & Sec - C (Physical)

Temperature dependence of enthalpy, Kirchoffs equation. Bond energies and applications of bond energies.

B Sc. - I & Sec - B (Biochemistry)

Structure, properties and Functions of Monosaccharides, Important disaccharides.

B Sc. - I & Sec - C (Biochemistry)

Essential fatty acids, triglycerides and their properties, cholesterol and its functions.

Second week

B Sc. - II & Sec - A (Organic)

Reactions of alcohols. Dihydric alcohols — nomenclature, methods of formation. Chemical reactions of vicinal glycols, oxidative cleavage [Pb(OAc)4 and HIO4] Pinacol-pinacolone rearrangement.

B Sc. - II & Sec - C (Physical)

Group Discussion and Revision of Thermodynamics -II

B Sc. - I & Sec - B (Biochemistry)

Composition and functions of important homopolysaccharides, physiological actions of unavailable carbohydrates (dietary fibres). **(Assignment)**

B Sc. - I & Sec - C (Biochemistry) Unit 4 Nucleic Acids

Chargaffs rule of DNA composition, Double helical structure of DNA, denaturation of DNA strands.

Third week

B Sc. - II & Sec - A (Organic) Unit 2. Epoxides

Synthesis of epoxides. Acid and base-catalyzed ring opening of epoxides, Orientation of epoxide ring opening. Reactions of Grignard & organolithium reagents reagents with epoxides.

B Sc. - II & Sec - C (Physical)

Problems taken on Thermodynamics- II

B Sc. - I & Sec - B (Biochemistry) Lipids

Introduction, classification and functions, saturated and unsaturated fatty acids. Essential fatty acids, triglycerides and their properties, cholesterol and its functions.

B Sc. - I & Sec - C (Biochemistry)

Group Discussion & Revision of Nucleic Acids.

Fourth week

B Sc. - II & Sec - A (Organic)

Section-D Carboxylic Acids & Acid Derivatives Nomenclature of Carboxylic acids, structure and bonding, physical properties, Acidity of carboxylic acids, effects of substituents on acid strength. Preparation of carboxylic acids. Reactions of carboxylic acids. Hell-Volhard-Zelinsky reaction.

B Sc. - II & Sec - C (Physical)

Group Discussion of Section Thermodynamics- I

B Sc. - I & Sec - B (Biochemistry) Section- C Proteins

Physical properties of Aino acids, peptide bond, General properties of proteins, Simple, conjugated and derived proteins.

B Sc. - I & Sec - C (Biochemistry)

Revision of Carbohydrates

Fifth week Diwali Break

November 2024

First week

B Sc. - II & Sec - A (Organic)

Reduction of carboxylic acids. Mechanism of decarboxylation. Structure , nomenclature and preparation of acid chlorides, esters, amides and acid anhydrides.

B Sc. - II & Sec - C (Physical)

Revision of Thermodynamics- 1

B Sc. - I & Sec -B (Biochemistry)

Nutritional classification of proteins, organization of proteins structures into primary, secondary, tertiary and quaternary structures, biological functions of proteins.

B Sc. - I & Sec - C (Biochemistry)

Test of Carbohydrates

Second week

B Sc. - II & Sec - A (Organic)

Relative stability of acyl derivatives. Physical properties, interconversion of acid derivatives by nucleophilic acyl substitution. Mechanisms of esterification and hydrolysis (acidic and basic).

B Sc. - II & Sec - C (Physical) Revision of Thermodynamics -II

B Sc. - I & Sec - B (Biochemistry) Test of Carbohydrates.

B Sc. - I & Sec - C (Biochemistry) Revision of Nucleic Acids

Third week

B Sc. - II & Sec - A(Organic)

Revision & Problem solving

B Sc. - II & Sec - C (Physical)

Revision & Problem solving

B Sc. - I & Sec - B (Biochemistry)

Revision & Problem solving

B Sc. - I & Sec - C (Biochemistry)

Revision & Problem solving

Government College For Women, Rohtak
Department of Chemistry
Name of the Faculty – **Dr. Deepak**
Section - **A, C & D**
Subject - **Organic Chemistry**

July 2024

NMR spectroscopy – I

Introduction, Magnetic properties of nuclei, Principle of nuclear magnetic resonance, PMR spectrum

August 2024

First Week- Nuclear spin states.
SECOND Week- NMR spectrometer, position of signals. chemical shift
Third week: number of signals, peak areas, equivalent and nonequivalent protons
Fourth week: shielding and deshielding of protons, proton counting.

September 2024

First Week- splitting of signals, coupling constants. magnetic equivalence of protons.
SECOND Week- Applications of PMR spectroscopy., Limitations of PMR spectroscopy.
Third week: Discussion of PMR spectra of the molecules, ethyl bromide, n-propyl bromide, isopropyl bromide.
Fourth week: 1,1-dibromoethane, 1,1,2-tribromoethane, ethanol.,acetaldehyde, ethyl acetate, toluene, benzaldehyde and acetophenone

OCTOBER 2024

First week - Simple problems on PMR spectroscopy for structure determination of organic compounds. **(Assignment and Test)**
Second week: Organomagnesium compounds- the Grignard Reagents-formation, structure.
Third week: Chemical reaction, Group revision and Problem solving.
Fourth week: organo zinc compounds, formation, - chemical reactions of organozinc compounds organolithium compounds chemical reactions of organolithium compounds

NOVEMBER 2024

First week: - Classification and nomenclature. - Monosaccharides, Mechanism of osazone formation, interconversion of glucose and fructose, Mechanism of mutarotation. Structures of ribose and deoxyribose
Second week. Chain lengthening and shortening of aldoses, Configuration of monosacharides, Introduction to disaccharides and polysaccharides without involving structure determination.
Third week – Erythro and threo diastereomers.,Open chain and cyclic structure of D (+)-glucose Open chain and cyclic structure of D (-) – fructose, Introduction to disaccharides and polysaccharides without involving structure determination.

Government College for Women , Rohtak

Department of Chemistry

Name of Faculty: POOJA RANI

Section : B

Subject : Physical and Oraganic Chemistry

July 2024

Quantum Mechanics

Week -4 : Black body radiation, Planks radiation law, photoelectric effect

August 2024

Week 1 : Heat capacity of solid , Comptons effect ,Wave function and its significance postulates of quantum mechanics.

Week 2 : quantum mechanical operator , Commutation relations , Hamiltonian operators , Hermitian operators .

NMR – Principle of Nuclear magnetic resonance , the PMR spectrum, number of signals , peak areas.

Week 3 : Average value of square of Harmitian as a positive quantity , role of operator to show quantum mechanically that position and momentum cannot be predicted simultaneously.

Week 4 : Equivalent and non – equivalent protons , postions of signals and chemical shift , shielding and de shielding of protons , protons counting , splitting of signals and coupling constants, magnetic equivalence of protons.

(**Assignment and discussion)**

September 2024

Quantum Mechanics

Week 1 : Determination of wave function and energy of particle in 1 dimensional box, pictorial representation and its significance , numerical problems.

(**ASSIGNMENT AND TEST)**

Week 2 :

NMR Spectroscopy – II : Discussion of PMR spectra of the molecule :Ethyl Bromide , npropyl Bromide , simple problems on PMR, isopropyl bromide 1,1,-dibromoethane, 1,1,2-tribromoethane , ethanol , acetaldehyde, ethyl acetate , toluene, benzaldehyde and acetophenone.

Week 3 : UNIT 2^{ND} – Optical activity , clausius – Mossotti equation. Orientation of Dipole in an electric field , dipole moment , included dipole moment , measurement of dipole moment – temperature method and refractivity method , dipole moment and structure of molecules, spectroscopy for structure determination of organic compounds ,

Week 4 : Magnetic permeability, magnetic susceptibility and its determination , application of magnetic susceptibility , Magnetic properties.

October 2024

Week 1 : Spectroscopy introduction : Electromagnetis radiation regions of spectrum , basic features of spectroscopy , statement of Bornoppenheimer approximation , degree of freedom, rotational spectrum of diatomic molecules , energy levels of rigid rotator, selection rules.

Week 2 :

Organometallic compounds:

Organomagnesium compounds , the Grignard reagent formation and structure , chemical reactions of Grignard reagent .

Spectral intensity distribution using population distribution, determination of bond length.

Week 3 : Qualitative description of non rigid rotor , isotope effect , vibrational spectrum, infrared spectrum : Energy level of simple harmonic oscillator selection rules , pure vibrational spectrum , determination of force constant and qualitative relation of force constant and bond energy , effects of unharmonic motion and isotope affect on the spectra,

Week 4: Idea of vibrational frequencies of different functional groups . Raman spectrum: Concept of polariziability , pure rotational and pure vibrational raman spectra of diatomic molecule , selection rule , quantum theory of raman spectra

(**REVISION AND TEST)**

November 2024

Week 1 :

Carbohydrate 1 : Classification and nomenclature . Monosaccharides , mechanis of osazone formation , interconversion of glucose and fructose , chain lengthening and chain shortening of aldoses. Configuration of monosaccharides . Erythro and threo diastereomers.

Week 2: Conversion of glucose into mannose, formation of glycosides , Ethrs and esters . Determination of ring size of glucose and fructose open chain and cucllic structures of D glucose and D fructose mechanism of mutarotation.

Structures of Ribose and deoxyribose .

Week 3:

Carbohydrates II : An introduction to disaccharides (Maltose , Sucrose and Lactose) and polysaccharides (Starch and cellulose) without involving structure determination.

CHEMISTRY DEPARTMENT GPGCW, ROHTAK

LESSON PLAN

NAME OF FACULTY- MANU KUMARI **CLASS- BSc. 1st MED. AND B.Sc.3rd(Sec-A)** **SUBJECT:1.SKILL CHEMISTRY(B.Sc 1st) 2.INORGANIC CHEMISTRY(B.Sc. 3rd)**

JULY 4TH WEEK: INORGANIC CHEMISTRY

unit 3:thermodynamic and kinetic aspects of metal complexes:

Introduction of transition metal complexes ,introduction of metal ligand bonding in metal complexes

SKILL CHEMISTRY- unit 1 Analysis of Soil and Water

Composition of soil, concept of pH and pH measurement of soil, complexometric titrations, chelation,

AUGUST 1ST INORGANIC CHEMISTRY

Few examples of Thermodynamic stability of transition metal complexes,defination of stability constant,equillibrium constants,dissociation constants.

SKILL CHEMISTRY- chelating agents, use of indicators, estimation of calcium and magnesium ions in soil. Definition of pure water,

AUGUST 2ND WEEK INORGANIC CHEMISTRY

Mathematical expression for stability constant of complexes,overall stability constant,commulative stability constant.

SKILL CHEMISTRY- sources responsible for contaminating water, water sampling methods, water purification methods,

AUGUST 3RD WEEK INORGANIC CHEMISTRY

Kinetic stabilty,thermodynamic stability,inertness and lability of transition metal complexes, examples of metal complexes which are thermodynamically stable but kinetically labile and vice-versa.

SKILL CHEMISTRY-determination of dissolved oxygen of a water sample.

AUGUST 4TH WEEK INORGANIC CHEMISTRY

Factors affecting the stability of complexes: nature of central metal ion,size of metal,electronegativity of metal ion,Irving-william series.

SKILL CHEMISTRY-A general study including preparation and uses of the following: Hair dye, soap, shampoo,

SEPTEMBER 1ST WEEK INORGANIC CHEMISTRY

Factors affecting the stability of complexes:nature of ligands,basic strength,presence of ring structure.

Chelate effect,chelation,stearic effects.

SKILL CHEMISTRY- suntan lotions, face powder, lipsticks, talcum powder, nail enamel.

SEPTEMBER 2nd WEEK INORGANIC CHEMISTRY

Substitution reactions in square planar complexes,oxidative addition followed by reductive elimination,electrophillic substitution ,nucleophillic substitution.

SKILL CHEMISTRY-Pesticides

General introduction to pesticides (natural and synthetic), benefits and adverse effects, changing concepts of pesticides,

SEPTEMBER 3rd WEEK INORGANIC CHEMISTRY

Rate law for nucleophillic subsatitution reaction in square planar complexes.

SKILL CHEMISTRY- brief introduction of structure activity relationship, synthesis and technical manufacture and uses of representative pesticides

SEPTEMBER 4th WEEK INORGANIC CHEMISTRY

association reaction,dissociation reaction,interchange association,interchange dissociation.

SKILL CHEMISTRY- : organochlorines (gammexene), organophosphates (malathion).

October 1st WEEK INORGANIC CHEMISTRY

Associative mechanism,evidences that supported associative mechanism.

SKILL CHEMISTRY- Experimental Techniques

Basic principle of pH metric, potentiometric and conductometric titrations,

October 2nd WEEK INORGANIC CHEMISTRY

Trans effect in square planar complexes.

SKILL CHEMISTRY- applications of conductivity measurements: determination of degree of dissociation, determination of Ka of acids and base,

October 3rd WEEK INORGANIC CHEMISTRY

trans directing series, trans effect in synthesis of complxes.

SKILL CHEMISTRY- buffer solution, buffer action, Henderson–Hazel equation

October 4th WEEK INORGANIC CHEMISTRY

Kurnakov test or kurnakov reaction,mechanism of nucleophillic substitution in square planar complexes.

SKILL CHEMISTRY-, buffer mechanism of buffer action.

NOVEMBER 1st WEEK INORGANIC CHEMISTRY

Theories of trans effect, polarisation theory,Pi bonding theory,

SKILL CHEMISTRY-group discussion

NOVEMBER 2nd WEEK INORGANIC CHEMISTRY- group discussion

SKILL CHEMISTRY-presentation by students

NOVEMBER 3rd WEEK INORGANIC CHEMISTRY-Test and assignment

SKILL CHEMISTRY-TEST AND ASSIGNMEN

Government College for Women, Rohtak

Department of Chemistry

Lesson Plan, Odd Semester (Session 2024-25)

Name of Extension Lecturer: **Meena (E-3038)**

B.Sc.1st Sem (MDC.) Section – **A**

B.Sc.2nd Sem Section – **A & B**
Subject - **Organic and Inorganic and Physical Chemistry**
July, 2024

Fourth Week --

BSc. 2 SEC B - Werner Coordination theory

BSc. 2 SEC A - Reversible Reaction

Biochemistry I - structure and shape of water molecule

August ,2024

First Week –

BSc. 2 SEC B - Effective atomic number

BSc. 2 SEC A - Equilibrium Constant

Biochemistry I -Physical properties of water

Second Week –

BSc. 2 SEC B - Chelates and nomenclature of coordination compound

BSc. 2 SEC A - Free Energy

Biochemistry I - chemical properties of water

Third Week --

. BSc. 2 SEC B - Isomeriosm in coordination compound

BSc. 2 SEC A - concept of chemical potential

Biochemistry I - Concept of Acid Bases

Fourth Week –

BSc. 2 SEC B - valance bond theory of transition metal complexes

BSc. 2 SEC A - law of chemical equilibrium

Biochemistry I - PH concept

September, 2024

First Week –

BSc. 2 SEC B - Equilibrium Constant & Free Energy

BSc. 2 SEC A – Thermodynamic Derivation of Law of chemical equilibrium

Biochemistry I - PH & PKa , PH of some aqueous liquid

Second Week –

BSc. 2 SEC B - concept of chemical potential

BSc. 2 SEC A – Temperature dependence of eqbm constant

Biochemistry I - Handerson Hasselbalch equation & its significance

Third Week --

BSc. 2 SEC B - Thermodynamic Derivation of Law of chemical equilibrium

BSc. 2 SEC A – Clausius Clapeyron equation

Biochemistry I - Physiological buffers

Fourth Week –

BSc. 2 SEC B - Temperature dependence of eqbm constant

BSc. 2 SEC A - clausium claperyon eq. Applications

Biochemistry I - Production of acids and bases in body

October, 2024 (27Oct -03Nov Diwali Vacation)

First Week –

BSc. 2 SEC B - Clausius Clapeyron equation & Applications

BSc. 2 SEC A – TEST 1

Biochemistry I - OFF

Second Week –

BSc. 2 SEC B - TEST

BSc. 2 SEC A – DOUBT SESSION

Biochemistry I - OFF

Third Week --

BSc. 2 SEC B - UV Spectroscopy: Absorption law,molar absorptivity

BSc. 2 SEC A – ASSIGNMENT & VIVA

Biochemistry I - Maintainance of blood pH

Fourth Week –

BSc. 2 SEC B - Presentation and Analysis of UV spectra, types of electronic transitions

BSc. 2 SEC A – Distribution law's Applications

Biochemistry I - Buffers in body to maintain blood PH

Fifth week -- Diwali Vacation

November, 2024

First Week – **Diwali Vacation**

Second Week –

BSc. 2 SEC B - Transition effect of conjugation,Chromophores and Auxochrome

BSc. 2 SEC A – Process of Extraction

Biochemistry I - ASSIGNMENT & VIVA

Third Week --

BSc. 2 SEC B - Bathochromic,Hypsochromic,Hyperchromic, Hypochromic shift ,UV spectra of conjugated systems

BSc. 2 SEC A – More stress on numerical problems

Biochemistry I - TEST

Fourth Week –

BSc. 2 SEC B - Woodward Fisher Rule, calc of lambda max, Application of UVspectra

BSc. 2 SEC A - TEST 2

Biochemistry I - PROBLEMS DISCUSSION

LESSON PLAN (2024-2025)

Name of the EXTENSION LECTURER: **Monika**

Class and Section**: B.Sc II Medical Sec-A ,B.Sc 1 (MDC)Biochem. Sec A**

July, 2024

Fourth Week --

B.Sc 1 Carbohydrates: Definition, sources, Functions and classification. Structure, properties and Functions of Monosaccharides

B.Sc 3rdsem UV spectroscopy absorption law, types of transitions, concept of chromophore and auxochrome

Fifth Week –

B.Sc 1 Important disaccharides, Composition and functions of important homopolysaccharides,

B.Sc 3rdsem bathochromic, hypsochromic, hyperchromic, hypochromic shifts

August, 2024

First Week

B.Sc 1. physiological actions of unavailable carbohydrates (dietary fibres)., **(Assignment)**

B.Sc 3rdsem Woodward fieser rules,calculation of lambda max of conjugated dienes

Second Week

B.Sc 1 Lipids Introduction, classification and functions, saturated and unsaturated fatty acids.

B.Sc 3rdsem Woodward fieser rules,calculation of lambda max of alpha-beta usaturated ketones, Application of UV spectroscopy in str. Elucidation of org comp

Third Week

B.Sc 1 Essential fatty acids, triglycerides and their properties, cholesterol and its functions

B.Sc 3rdsem Monohydric alcohols nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids and esters. Hydrogen bonding. Acidic nature.

Fourth Week

B.Sc 1 Chargaffs rule of DNA composition, Double helical structure of DNA, denaturation of DNA strands.

B.Sc 3rdsem Reactions of alcohols. Dihydric alcohols — nomenclature, methods of formation.

Chemical reactions of vicinal glycols, oxidative cleavage [Pb(OAc)4 and HIO4]

Pinacol-pinacolone rearrangement.

Fifth week.

B.Sc 1 (Test of Section B)

B.Sc 3rdsem Epoxides

Synthesis of epoxides. Acid and base-catalyzed ring opening of epoxides, Orientation of epoxide ring opening. Reactions of Grignard & organolithium reagents reagents with epoxides.

September, 2024

First Week B.Sc 1 Introduction of Proteins, Physical properties of Amino Acids. ,

Essential and Nonessential Amino Acids

B.Sc 3rdsem Nomenclature of Phenols, Structure and Bonding of phenols. Preparation of Phenols.

Second Week

B. Sc 1 Peptide bond, General properties of proteins. Simple , Conjugated and derived Proteins.

B. Sc 3rd sem . Physical Properties and acidic Character of Phenols, Comparative acidic strengths of alcohols and phenols. Resonance stabilization of Phenoxide ion.

Third Week --

BSc. 1st: Nutritional classification of proteins, Organizations of proteins structure into Primary Structure.

B.Sc 3rdsem. Chemical Reactions of phenols, Electrophilic Aromatic Substitution (EAS) Reaction, Mechanism of Fries Rearrangement

Fourth Week.

BSc. 1st: Organizations of proteins structure into Secondary Structure

B.Sc 3rdsem., Mechanism of Claisen Rearrangement.,Reimer-Tiemann Reaction.

Mechanism of Reimer-Tiemann Reaction

Fifth week

B.Sc 1 Organizations of proteins structure into Tertiary Structure

B.Sc 3rdsem.,Kolbes Reaction
Mechanism of Kolbes Reaction, Schotten and Baumann Reactions.
Mechanism of Schotten and Baumann Reactions

October, 2024 (27Oct -03Nov Diwali Vacation)

First Week
B.Sc 1 Organizations of proteins structure into Quaternary Structur
Biological Functions of Proteins.
B.Sc 3rdsem Carboxylic Acids & Acid Derivatives

Nomenclature of Carboxylic acids, structure and bonding, physical properties,
Second Week –.
B.Sc 1 Revision & Group Discussion Class of Proteins.
Introduction of Nucleic Acid.
B.Sc 3rdsem Acidity of carboxylic acids, effects of substituents on acid strength. Preparation of carboxylic acids. Reactions of carboxylic acids. Hell-Volhard-Zelinsky reaction.

Third Week
B.Sc 1 Nucleosides and their structures
B.Sc 3rdsem Reduction of carboxylic acids. Mechanism of decarboxylation. Structure , nomenclature and preparation of acid chlorides, esters, amides and acid anhydrides.
Fourth Week.

B.Sc 1 Nucleotides and their structures.

Purines and Pyrimidine's.

B.Sc 3rdsem Relative stability of acyl derivatives. Physical properties, interconvers ion of acid derivatives by nucleophilic acyl substitution. Mechanisms of esterification and hydrolysis (acidic and basic).

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Fifth week -- Diwali Vacation

November, 2024

First Week – Diwali Vacation

Second Week –

BSc. 1st: Revision of Nucleic Acid.

B.Sc.3rd Revision of Phenol

Third Week --

BSc. 1st: Group Discussion of Nucleic Acid.

B.Sc.3rd Group Discussion Class of Phenol.

Fourth Week –

BSc. 1st: Test and Assignment of Nucleic Acid.

B.Sc.3rd Test and Assignment of Phenols.

Government College For Women, Rohtak
Department of Chemistry
Name of the Faculty **– Pooja Chahal**
Section – **A, C, D**
Subject -**Physical Chemistry**
JULY 2024
Quantum Mechanics

Week 4 : Black body radiation, Planks radiation Law, Photoelecric effect.

SEPTEMBER 2024

Week 1: Heat capacity of solids, Comptons effect. Wave function and its significance postulates of quantum mechanics. Quantum mechanical operator, commutation relations, Hamiltonian operators, Hermitian operators.
Week 2: Average value of square of hermitian as a positive quantity, Role of operator in quantum mechanics to show quantum mechanically that position and momentum cannot be predicted simultaneously, determination of wave function and energy of particle in one dimensional box, pictorial representation and its significance.Numerical problems
Week 3: Optical activity, clausius – Mossotti equation. Orientation of dipoles in an electric field, dipole moment, included dipole moment, : measurement of dipole moment-temperature method and refractivity method, dipole moment and structure of molecules,

OCTOBER 2024

Week 1: Magnetic permeability, magnetic susceptibility and its determination. Applica tion of magnetic susceptibility, magnetic properties – paramagnetism, diamagnetism and ferromagnetics.
WEEK 2: Spectroscopy-introduction: Electromagnetic radiation, regions of spectrum, basic features of spectroscopy, statement of Born oppenheimer approximation, Degrees of freedom, Rotational Spectrum Diatomic molecules. Energy levels of rigid rotator (semi-classical principles), selection rules
WEEK 3: Test of unit 2, spectral intensity distribution using population distribution (Maxwell-Boltzmann distribution), determination of bond length, qualitative

description of non-rigid rotor, isotope effect, Vibrational spectrum Infrared spectrum: Energy levels of simple harmonic oscillator, selection rules, pure vibrational spectrum, intensity

Week 4: test & Diwali vacations

November 2024

Week 1: determination of force constant and qualitative relation of force constant and bond energies, effects of anharmonic motion and isotopic effect on the spectra. idea of vibrational frequencies of different functional groups. Raman Spectrum: Concept of polarizibility,

Week 2: pure rotational and pure vibrational Raman spectra of diatomic molecules, selectin rules, Quantum theory of Raman spectra

CHEMISTRY DEPARTMENT GPGCW, ROHTAK

LESSION PLAN

NAME OF FACULTY- PREETI CLASS- BSc. 1st Non Med.AND MED. SUBJECT -1.MAJOR CHEMISTRY

2. SKILL CHEMISTRY

JULY 4TH WEEK MAJOR CHEMISTRY

unit 1 Chemical Bonding and Molecular Structure

Ionic bond, lattice energy, Born-Haber cycle and its applications, Fajan's rules, hydration energy, bond moment, dipole moment and percentage ionic character.

SKILL CHEMISTRY- unit 1 Analysis of Soil and Water

Composition of soil, concept of pH and pH measurement of soil, complexometric titrations, chelation,

AUGUST 1ST WEEK MAJOR CHEMISTRY

Resonance and resonance energy: study of some inorganic and organic compounds.

SKILL CHEMISTRY- chelating agents, use of indicators, estimation of calcium and magnesium ions in soil. Definition of pure water,

AUGUST 2ND WEEK MAJOR CHEMISTRY

Molecular Orbital Approach: LCAO method, bonding and antibonding MOs and their characteristics for s-s, s-p and p-p combination of atomic orbitals, non- bonding combination of orbitals

SKILL CHEMISTRY- sources responsible for contaminating water, water sampling methods, water purification methods,

AUGUST 3RD WEEK MAJOR CHEMISTRY

MO treatment of homonuclear diatomic molecules of 1st and 2nd periods (including idea of s-p 17 mixing) and heteronuclear diatomic molecules such as O_2^-, O_2^{2-}, N_2^-, CO, NO^+, CN^-.

SKILL CHEMISTRY-determination of dissolved oxygen of a water sample.

AUGUST 4TH WEEK MAJOR CHEMISTRY

Comparison of VB and MO approach

SKILL CHEMISTRY-A general study including preparation and uses of the following: Hair dye, soap, shampoo,

SEPTEMBER 1ST WEEK MAJOR CHEMISTRY

Unit–II p-Block Elements

Oxides – structures of oxides of N, P. Oxyacids – structure and relative acid strengths of oxyacids of nitrogen and phosphorus.

SKILL CHEMISTRY- suntan lotions,
face powder, lipsticks, talcum powder, nail enamel.

SEPTEMBER 2nd MAJOR CHEMISTRY

Structure of white, yellow and red phosphorus. Oxyacids of sulphur – structures and acidic strength, H2O2–structure, properties and uses. Basic properties of halogen, interhalogen compounds-types and properties,

SKILL CHEMISTRY-Pesticides

General introduction to pesticides (natural and synthetic), benefits and adverse effects, changing concepts of pesticides,

SEPTEMBER 3rd WEEK MAJOR CHEMISTRY

halogen-acids and oxyacids of chlorine – structure and comparison of acidic strength.
Acids and Bases: Brönsted–Lowry concept, conjugate acids and bases, relative strengths of acids and bases, effects of substituent and solvent, differentiating and levelling solvents.

SKILL CHEMISTRY- brief introduction of structure activity relationship, synthesis and technical manufacture and uses of representative pesticides

SEPTEMBER 4th WEEK MAJOR CHEMISTRY

Lewis acid-base concept, classification of Lewis acids and bases, Lux-Flood concept.

SKILL CHEMISTRY- : organochlorines (gammexene), organophosphates (malathion).

October 1st WEEK MAJOR CHEMISTRY

Unit–III Gaseous States

Maxwell's distribution of velocities and energies (derivation excluded), calculation of root mean square velocity, average velocity and most probable velocity.

SKILL CHEMISTRY- Experimental Techniques

Basic principle of pH metric, potentiometric and conductometric titrations,

October 2nd WEEK MAJOR CHEMISTRY

Collision diameter, collision number, collision frequency and mean free path, deviation of real gases from ideal behaviour,

SKILL CHEMISTRY- applications of conductivity measurements: determination of degree of dissociation, determination of K_a of acids and base,

October 3rd WEEK MAJOR CHEMISTRY

derivation of Van der Waals Equation of state and its applications in the calculation of Boyle's temperature (compression factor),

SKILL CHEMISTRY- buffer solution, buffer action, Henderson–Hazel equation

October 4th WEEK MAJOR CHEMISTRY

explanation of behavior of real gases using Van der Waals equation. Critical Phenomenon: Critical temperature, critical pressure, critical volume and their determination.

NOVEMBER 1st WEEK MAJOR CHEMISTRY

PV isotherms of real gases, continuity of states, isotherms of Van der Waals equation, relationship between critical constants and Van der Waals constants, compressibility factor. Law of corresponding states.

NOVEMBER 2nd WEEK MAJOR CHEMISTRY

Unit–IV Basics of Organic Chemistry and Stereochemistry

Electronic displacements and its applications, reaction intermediates and concept of aromaticity. Concept of isomerism, types of isomerism, optical isomerism, optical activity, elements of symmetry, molecular chirality, enantiomers,

SKILL CHEMISTRY-, buffer mechanism of buffer action.

NOVEMBER 3rd WEEK MAJOR CHEMISTRY

stereogenic centre, properties of enantiomers, chiral and achiral molecules with two stereogenic centres, diastereomers, threo and erythro diastereomers, meso compounds, resolution of enantiomers, inversion, retention and racemization, relative and absolute configuration, sequence rules, R & S system of nomenclature.

SKILL CHEMISTRY-TEST AND ASSIGNMENT.

CHEMISTRY DEPARTMENT GPGCW, ROHTAK

LESSION PLAN

NAME OF FACULTY- SANGEETA CLASS- BSc. 1st Med

SUBJECT- 1.MAJOR CHEMISTR , 2. MINOR CHEMISTRY

JULY 4TH WEEK

MAJOR CHEMISTRY Chemical Bonding and Molecular Structure

Ionic bond, lattice energy, Born-Haber cycle and its applications, Fajan's rules, hydration energy, bond moment, dipole moment and percentage ionic character.

MINOR CHEMISTRY Unit I :Atomic Structure

Atomic models, Rutherford's model and its limitations, Bohr's model and its applications, dual nature of matter and light, de Broglie's relationship

AUGUST 1ST WEEK

MAJOR CHEMISTRY Resonance and resonance energy: study of some inorganic and organic compounds.

MINOR CHEMISTRY Heisenberg uncertainty principle, concept of orbitals, quantum numbers, shapes of s, p and d orbitals,

AUGUST 2ND WEEK

MAJOR CHEMISTRY Molecular Orbital Approach: LCAO method, bonding and antibonding MOs and their characteristics for s-s, s-p and p-p combination of atomic orbitals, non- bonding combination of orbitals

MINOR CHEMISTRY for filling electrons in orbitals rules - Aufbau principle, Pauli's 20 exclusion principle and Hund's rule, electronic configuration of atoms, stability of half-filled and completely filled orbitals.

AUGUST 3RD WEEK

MAJOR CHEMISTRY MO treatment of homonuclear diatomic molecules of 1st and 2nd periods (including idea of s-p 17 mixing) and heteronuclear diatomic molecules such as O2 - , O2 2- , N2 - , CO, NO+ , CN- .

MINOR CHEMISTRY Unit–II Periodic Table and Atomic Properties

Brief history of the development of periodic table,

AUGUST 4TH WEEK

MAJOR CHEMISTRY Comparison of VB and MO approach

MINOR CHEMISTRY modern periodic law and the present form of periodic table, periodic trends in properties of elements -atomic radii, ionic radii, inert gas radii,

SEPTEMBER 1ST WEEK

MAJOR CHEMISTRY Unit–II p-Block Elements Oxides – structures of oxides of N, P. Oxyacids – structure and relative acid strengths of oxyacids of nitrogen and phosphorus.

MINOR CHEMISTRY ionization enthalpy, electron gain enthalpy, electronegativity, valency

SEPTEMBER 2nd

MAJOR CHEMISTRY Structure of white, yellow and red phosphorus. Oxyacids of sulphur – structures and acidic strength, H2O2–structure, properties and uses. Basic properties of halogen, interhalogen compounds-types and properties,

MINOR CHEMISTRY Nomenclature of elements with atomic number greater than 100.

SEPTEMBER 3rd WEEK

MAJOR CHEMISTRY halogen-acids and oxyacids of chlorine – structure and comparison of acidic strength.

Acids and Bases: Brönsted–Lowry concept, conjugate acids and bases, relative strengths of acids and bases, effects of substituent and solvent, differentiating and levelling solvents.

SEPTEMBER 4th WEEK

MAJOR CHEMISTRY Lewis acid-base concept, classification of Lewis acids and bases, Lux-Flood concept.

MINOR CHEMISTRY test and assignments

October 1st WEEK

MAJOR CHEMISTRY Unit–III Gaseous States : Maxwell's distribution of velocities and energies (derivation excluded), calculation of root mean square velocity, average velocity and most probable velocity.

MINOR CHEMISTRY . Unit–III Mole Concept : Atomic mass, mole concept and molar mass, Avogadro's number and its significance

October 2nd WEEK

MAJOR CHEMISTRY Collision diameter, collision number, collision frequency and mean free path, deviation of real gases from ideal behaviour, test and assignments

MINOR CHEMISTRY percentage composition, empirical and molecular formula

October 3rd WEEK

MAJOR CHEMISTRY derivation of Van der Waals Equation of state and its applications in the calculation of Boyle's temperature (compression factor),

MINOR CHEMISTRY chemical reactions, ways of expressing concentration of solutions -molarity

October 4th WEEK

MAJOR CHEMISTRY explanation of behavior of real gases using Van der Waals equation. Critical Phenomenon: Critical temperature, critical pressure, critical volume and their determination.

MINOR CHEMISTRY normality, molality, mole percentage, strength stoichiometric calculations involving reactants and products.

NOVEMBER 1st WEEK

MAJOR CHEMISTRY PV isotherms of real gases, continuity of states, isotherms of Van der Waals equation, relationship between critical constants and Van der Waals constants, compressibility factor. Law of corresponding states.

MINOR CHEMISTRY Unit–IV Fundamentals of Organic Chemistry : Electronic displacements: Inductive effect, electromeric effect,

NOVEMBER 2nd WEEK

MAJOR CHEMISTRY Unit–IV Basics of Organic Chemistry and Stereochemistry
Electronic displacements and its applications, reaction intermediates and concept of aromaticity. Concept of isomerism, types of isomerism, optical isomerism, optical activity, elements of symmetry, molecular chirality, enantiomers,

MINOR CHEMISTRY resonance, hyperconjugation. Cleavage of bonds: homolysis and heterolysis. Reaction intermediates: carbocations, carbanions, free radicals, and carbenes.

NOVEMBER 3rd WEEK

MAJOR CHEMISTRY stereogenic centre, properties of enantiomers, chiral and achiral molecules with two stereogenic centres, diastereomers, threo and erythro diastereomers, meso compounds, resolution of enantiomers, inversion, retention and racemization, relative and absolute configuration, sequence rules, R & S system of nomenclature.

MINOR CHEMISTRY Electrophiles and nucleophiles. Aromaticity: benzenoids and Huckel's rule.

Government College For Women, Rohtak

Department of Chemistry

Name of Faculty **– Seema**

Section – **B&C**

Subject – **Physical**

July – 2024

Thermodynamics-II

Week 4 : Calculation of W, q, dU and dH for th expansion of ideal gases under isothermal and adiabatic conditions for reversible process. Structure and shape of water molecules.

August – 2024

Week 1 : Temperature dependence of enthalpy, Kirchoffs equation. Bond energies and applications of bond energies. Physcial properties of water, concept of acids and bases , pH & pka,pH of some aqueous fluids.

Chemical Equilibirium

Week 2 : Equilibirium constant and free energy, concept of chemical potential.

Buffers: Handerson-Hasselbalch equation and its significance.

Week 3 : Thermodynamic derivation of law of chemical equilibrium. Physiological buffers.

Week 4: Temperature dependence of equilibrium constant; Van't Hoff reaction isochore, Van't Hoff reaction isotherm.

September – 2024

Week 1 : Le-Chatelier's principle and its application. Production of acids and bases in body and maintenance of blood pH by phosphate buffer system.

Distribution law

Week 2 : Clapeyron equation and Clausius- Clapeyron equation, its application. Bicarbonate buffer system.

Week 3 : Nernst distribution law – its thermodynamic derivation.

Week 4: Modification of distribution law distribution law when solute undergoes dissociating

Oct – 2024

Week 1 : Association and chemical combination.

Week 2 : Applications of distribution law.

Week 3 : Determination of degree of hydrolysis.

Week 4 : hydrolysis constant of aniline hydrochloride.

Nov – 2024

Week 1 : Determination of equilibrium constant of potassium tri-iodide complex.

Week 2 : process of extraction.

Week 3: Test

Week 4 : Discussion of last year questions.

Government PG College for Women, Rohtak

Lesson Plan Semester - III

Name of Faculty : Dr. Sonika

Subject : Inorganicl Chemistry
B.Sc. II (Medical and Non-medical)

Sections – A, B and C

July 2024

Fourth week – Definition of transition elements, position in the periodic table.

August 2024

First week – General characteristics & properites of Ist transition elements

Second week- –Trends in characteristics & properites of Ist transition elements

Third week – Comparison of Ist transition elements with second and third transition series

Fourth week – Magnetic Properties of transition elements

September 2024

First week- Structures & properties of some compounds of transition elements – TiO_2, $VOCl_2$

Second week - Structures & properties of some compounds of transition elements – $FeCl_3$, $CuCl_2$ and $Ni(CO)_4$

Third week – Werner's coordination theory, effective atomic number concept

Fourth week – chelates, nomenclature of coordination compounds

October 2024

First week – Isomerism in coordination compounds

Second week- valence bond theory of transition metal complexes
Third week – Difference between Valence bond theory and molecular orbital theory
Fourth week - revision unit 3

November 2024

First week- Diwali Break
Physical properties of a solvent, types of solvents and their general characteristics, Reactions in non-aqueous solvents with reference to liquid SO_2

Second week- Reactions in non-aqueous solvents with reference to liquid NH_3

Third week – **revision**

CHEMISTRY DEPARTMENT GPGCW, ROHTAK

LESSION PLAN

NAME OF FACULTY- VIJAITA CLASS- BSc. 1st Non Med

SUBJECT- 1.MAJOR CHEMISTRY, 2. MINOR CHEMISTRY

JULY 4TH WEEK

MAJOR CHEMISTRY Chemical Bonding and Molecular Structure
Ionic bond, lattice energy, Born-Haber cycle and its applications, Fajan's rules, hydration energy, bond moment, dipole moment and percentage ionic character.

MINOR CHEMISTRY Unit I :Atomic Structure
Atomic models, Rutherford's model and its limitations, Bohr's model and its applications, dual nature of matter and light, de Broglie's relationship

AUGUST 1ST WEEK

MAJOR CHEMISTRY Resonance and resonance energy: study of some inorganic and organic compounds.

MINOR CHEMISTRY Heisenberg uncertainty principle, concept of orbitals, quantum numbers, shapes of s, p and d orbitals,

AUGUST 2ND WEEK

MAJOR CHEMISTRY Molecular Orbital Approach: LCAO method, bonding and antibonding MOs and their characteristics for s-s, s-p and p-p combination of atomic orbitals, non- bonding combination of orbitals

MINOR CHEMISTRY for filling electrons in orbitals rules - Aufbau principle, Pauli's 20 exclusion principle and Hund's rule, electronic configuration of atoms, stability of half-filled and completely filled orbitals.

AUGUST 3RD WEEK

MAJOR CHEMISTRY MO treatment of homonuclear diatomic molecules of 1st and 2nd periods (including idea of s-p 17 mixing) and heteronuclear diatomic molecules such as O2 - , O2 2- , N2 - , CO, NO+ , CN- .

MINOR CHEMISTRY Unit–II Periodic Table and Atomic Properties
Brief history of the development of periodic table,

AUGUST 4TH WEEK

MAJOR CHEMISTRY Comparison of VB and MO approach

MINOR CHEMISTRY modern periodic law and the present form of periodic table, periodic trends in properties of elements -atomic radii, ionic radii, inert gas radii,

SEPTEMBER 1ST WEEK

MAJOR CHEMISTRY Unit–II p-Block Elements Oxides – structures of oxides of N, P. Oxyacids – structure and relative acid strengths of oxyacids of nitrogen and phosphorus.

MINOR CHEMISTRY ionization enthalpy, electron gain enthalpy, electronegativity, valency

SEPTEMBER 2nd

MAJOR CHEMISTRY Structure of white, yellow and red phosphorus. Oxyacids of sulphur – structures and acidic strength, H2O2–structure, properties and uses. Basic properties of halogen, interhalogen compounds-types and properties,

MINOR CHEMISTRY Nomenclature of elements with atomic number greater than 100.

SEPTEMBER 3rd WEEK

MAJOR CHEMISTRY halogen-acids and oxyacids of chlorine – structure and comparison of acidic strength.

Acids and Bases: Brönsted–Lowry concept, conjugate acids and bases, relative strengths of acids and bases, effects of substituent and solvent, differentiating and levelling solvents.

SEPTEMBER 4th WEEK

MAJOR CHEMISTRY Lewis acid-base concept, classification of Lewis acids and bases, Lux-Flood concept.

MINOR CHEMISTRY test and assignments

October 1st WEEK

MAJOR CHEMISTRY Unit–III Gaseous States : Maxwell's distribution of velocities and energies (derivation excluded), calculation of root mean square velocity, average velocity and most probable velocity.

MINOR CHEMISTRY . Unit–III Mole Concept : Atomic mass, mole concept and molar mass, Avogadro's number and its significance

October 2nd WEEK

MAJOR CHEMISTRY Collision diameter, collision number, collision frequency and mean free path, deviation of real gases from ideal behaviour, test and assignments

MINOR CHEMISTRY percentage composition, empirical and molecular formula

October 3rd WEEK

MAJOR CHEMISTRY derivation of Van der Waals Equation of state and its applications in the calculation of Boyle's temperature (compression factor),

MINOR CHEMISTRY chemical reactions, ways of expressing concentration of solutions -molarity

October 4th WEEK

MAJOR CHEMISTRY explanation of behavior of real gases using Van der Waals equation. Critical Phenomenon: Critical temperature, critical pressure, critical volume and their determination.

MINOR CHEMISTRY normality, molality, mole percentage, strength stoichiometric calculations involving reactants and products.

NOVEMBER 1st WEEK

MAJOR CHEMISTRY PV isotherms of real gases, continuity of states, isotherms of Van der Waals equation, relationship between critical constants and Van der Waals constants, compressibility factor. Law of corresponding states.

MINOR CHEMISTRY Unit–IV Fundamentals of Organic Chemistry : Electronic displacements: Inductive effect, electromeric effect,

NOVEMBER 2nd WEEK

MAJOR CHEMISTRY Unit–IV Basics of Organic Chemistry and Stereochemistry

Electronic displacements and its applications, reaction intermediates and concept of aromaticity. Concept of isomerism, types of isomerism, optical isomerism, optical activity, elements of symmetry, molecular chirality, enantiomers,

MINOR CHEMISTRY resonance, hyperconjugation. Cleavage of bonds: homolysis and heterolysis. Reaction intermediates: carbocations, carbanions, free radicals, and carbenes.

NOVEMBER 3rd WEEK

MAJOR CHEMISTRY stereogenic centre, properties of enantiomers, chiral and achiral molecules with two stereogenic centres, diastereomers, threo and erythro diastereomers, meso compounds, resolution of enantiomers, inversion, retention and racemization, relative and absolute configuration, sequence rules, R & S system of nomenclature.

MINOR CHEMISTRY Electrophiles and nucleophiles. Aromaticity: benzenoids and Huckel's rule.

CHEMISTRY DEPARTMENT GPGCW, ROHTAK

LESSION PLAN

NAME OF FACULTY- NIDHI CLASS- BSc. 1st Non Med

SUBJECT- 1.MAJOR CHEMISTRY, 2. MINOR CHEMISTRY

JULY 4TH WEEK

MAJOR CHEMISTRY Chemical Bonding and Molecular Structure

Ionic bond, lattice energy, Born-Haber cycle and its applications, Fajan's rules, hydration energy, bond moment, dipole moment and percentage ionic character.

BIOCHEMISTRY Unit I :WATER

Structure and shape of water molecules , uses

ORGANIC CHEM.-UV spectroscopy absorption law

AUGUST 1ST WEEK

MAJOR CHEMISTRY Resonance and resonance energy: study of some inorganic and organic compounds.

BIO CHEMISTRY PHYSICAL PROPERTIES of water,conceot of acid

ORGANIC CHEM.- types of transitions, concept of chromophore and auxochrome

AUGUST 2ND WEEK

MAJOR CHEMISTRY Molecular Orbital Approach: LCAO method, bonding and antibonding MOs and their characteristics for s-s, s-p and p-p combination of atomic orbitals, non- bonding combination of orbitals

.BIO **CHEMISTRY** concept of basesand concept of ph.

ORGANIC CHEM.-bathochromic, hypsochromic, hyperchromic, hypochromic shifts

AUGUST 3RD WEEK

MAJOR CHEMISTRY MO treatment of homonuclear diatomic molecules of 1st and 2nd periods (including idea of s-p 17 mixing) and heteronuclear diatomic molecules such as O2 - , O2 2- , N2 - , CO, NO+ , CN- .

BIO CHEMISTRY .Concept of pka,

ORGANIC CHEM -Woodward fieser rules,calculation of lambda max of conjugated dienes,a

AUGUST 4TH WEEK

BIOCHEMISTRY BUFFER: handerson hasselbalch equation and its significance

ORGANIC CHEM. Woodward fieser rules,calculation of lambda max of conjugated dienes,alpha-beta usaturated ketones

SEPTEMBER 1ST WEEK

MAJOR CHEMISTRY Unit–II p-Block Elements Oxides – structures of oxides of N, P. Oxyacids – structure and relative acid strengths of oxyacids of nitrogen and phosphorus.

BIOCHEMISTRY physiological buffers;

ORGANIC CHEM.-- Application of UV spectroscopy in str. Elucidation of org comp

SEPTEMBER 2nd

MAJOR CHEMISTRY Structure of white, yellow and red phosphorus. Oxyacids of sulphur – structures and acidic strength, H2O2–structure, properties and uses. Basic properties of halogen, interhalogen compounds-types and properties,

BIOCHEMISTRY production of acid and bases in body

ORGANIC CHEM. PROBLEMS

SEPTEMBER 3rd WEEK

MAJOR CHEMISTRY halogen-acids and oxyacids of chlorine – structure and comparison of acidic strength.

Acids and Bases: Brönsted–Lowry concept, conjugate acids and bases, relative strengths of acids and bases, effects of substituent and solvent, differentiating and levelling solvents

ORGANIC CHEM. - TEST.

SEPTEMBER 4th WEEK

MAJOR CHEMISTRY Lewis acid-base concept, classification of Lewis acids and bases, Lux-Flood concept.

BIOCHEMISTRY holiday

ORGANIC CHEM.-ASSIGMENT

October 1st WEEK

MAJOR CHEMISTRY Unit–III Gaseous States : Maxwell's distribution of velocities and energies (derivation excluded), calculation of root mean square velocity, average velocity and most probable velocity.

BIOCHEMISTRY holiday

October 2nd WEEK

MAJOR CHEMISTRY Collision diameter, collision number, collision frequency and mean free path, deviation of real gases from ideal behaviour, test and assignments

BIOCHEMISTRY maintenance of blood ph by phosphate buffer system

October 3rd WEEK

MAJOR CHEMISTRY derivation of Van der Waals Equation of state and its applications in the calculation of Boyle's temperature (compression factor),

BIOCHEMISTRY test and revision

October 4th WEEK

MAJOR CHEMISTRY explanation of behavior of real gases using Van der Waals equation. Critical Phenomenon: Critical temperature, critical pressure, critical volume and their determination.

BIOCHEMISTRY holiday

NOVEMBER 1st WEEK

MAJOR CHEMISTRY PV isotherms of real gases, continuity of states, isotherms of Van der Waals equation, relationship between critical constants and Van der Waals constants, compressibility factor. Law of corresponding states.

BIOCHEMISTRY holiday

NOVEMBER 2nd WEEK

MAJOR CHEMISTRY Unit–IV Basics of Organic Chemistry and Stereochemistry
Electronic displacements and its applications, reaction intermediates and concept of aromaticity. Concept of isomerism, types of isomerism, optical isomerism, optical activity, elements of symmetry, molecular chirality, enantiomers,

BIOCHEMISTRY biocarbonate buffer system

NOVEMBER 3rd WEEK

MAJOR CHEMISTRY stereogenic centre, properties of enantiomers, chiral and achiral molecules with two stereogenic centres, diastereomers, threo and erythro diastereomers, meso compounds, resolution of enantiomers, inversion, retention and racemization, relative and absolute configuration, sequence rules, R & S system of nomenclature..

BIOCHEMISTRY test and revision