

# GOVERNMENT COLLEGE BIROHAR (JHAJJAR)

Summary of Lesson Plans of College Faculty for Academic Session 2024-25

Name of Assistant/Associate Professor: Dr. Seetu Singh

Class: B.Sc. I<sup>st</sup> Year

Subject: Chemistry - SEC.

Semester: I<sup>st</sup>

| Months            | Topics/Chapters to be Covered                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| July<br>2024      | <p>Unit - I</p> <p>Analysis of Soil and water :-<br/>Composition of soil, concept of pH and pH measurement of soil, complexometric titrations, chelation, chelating agents, use of indicators, estimation of calcium and magnesium ions in soil. Definition of pure water, sources responsible for contaminating water, water sampling methods, water purification methods, determination of dissolved oxygen of a water sample.</p> |
| August<br>2024    | <p>Unit II</p> <p>Chemistry in Cosmetics :-<br/>A general study including preparation and uses of the following: Hair dye, soap, shampoo, suntan lotions, face powder, lipsticks, talcum powder, nail enamel.</p>                                                                                                                                                                                                                    |
| September<br>2024 | <p>Unit III</p> <p>Pesticides :-<br/>General introduction to pesticides (natural and synthetic) benefits and adverse effects, changing concepts of pesticides, brief introduction of structure activity relationship, syntheses and technical manufacture and uses of representative pesticides in the following classes:</p> <p>organochlorines (gammexene), organophosphates malathion.</p> <p>Unit - I</p>                        |

October  
2024

## Unit - IV

Experimental Techniques ÷ Basic principle of pH  
metric, potentiometric and conductometric  
titrations, applications of conductivity  
measurements, determination of degree of  
dissociation, determination of  $K_a$  of  
acids and base, buffer solution, buffer  
action, Henderson - Hazel equation, buffer  
mechanism of buffer action.

November  
2024

UT - II

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Signature of Asst/Asso. Professor

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Name of Assistant/Associate Professor: Dr. Seethy Singh

Class: B.Sc. 1<sup>st</sup> Year

Semester: 1<sup>st</sup>

Subject: Chemistry - DSC.

| Months         | Topics/Chapters to be Covered                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| July 2024      | <p><u>Chemical Bonding and Molecular Structure :-</u></p> <p>Ionic bond, lattice energy, Born-Haber cycle and its applications, Fajan's rules, hydration energy, bond moment, dipole moment and percentage ionic character. Resonance and resonance energy. Study of some inorganic and organic compounds. 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, MO treatment of 1<sup>st</sup> and 2<sup>nd</sup> periods including idea of s-p mixing and heteronuclear diatomic molecules such as <math>O_2^-</math>, <math>O_2^+</math>, <math>N_2^-</math>, <math>Co</math>, <math>NO^+</math>, <math>CN^-</math>, Comparison of VB and MO approaches.</p> |
| August 2024    | <p><u>P-Block Elements :-</u></p> <p>Oxides - structure of oxides of N, P oxyacids - structure and relative acid strengths of oxyacids of nitrogen and phosphorus. Structure of white, yellow and red phosphorous. Oxyacids of sulphur - structures and acidic strength. <math>H_2O_2</math> - structure, properties and uses.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| September 2024 | <p>Basic properties of Halogen, interhalogen compounds - types and properties. Halogen - acids and oxides of chlorine - structure and comparison of acid strength.</p> <p><u>Acids and Bases :-</u> Bronsted-Lowry concept, conjugate acids and bases, relative strengths of acids and bases, effects of substituent and solvent, differentiating and labelling solvents; Lewis acid-base concept, classification of Lewis acids and bases. Lux-Flood concept.</p> <p>UT - I</p> <p><u>Gaseous state :-</u></p> <p>Maxwell's distribution of velocities and energies (derivation excluded), calculation of root mean</p>                                                                                                                                                                           |

October  
2024

square velocity, average velocity and most probable velocity. Collision diameter, collision no., collision frequency and mean free path, division of real gases from ideal behaviour, derivation of Vander Waals Equation of state and its applications in the calculation of Boyle's temperature (compression factor) explanation of behaviour of real gases using Vander Waals equation.

Critical Phenomena: Critical temp., critical pressure, critical volume and their determination. P-V isotherms of real gases, continuity of states, isotherms of Vander Waals equation, relationship between critical constants and Vander Waals constants, compressibility factor. Law of corresponding states.

VI-II

November  
2024

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, stereogenic centre, properties of diastereomers, meso compounds, Resolution of enantiomers, inversion, retention and racemization, relative and absolute configuration, sequence rules, R & S system of nomenclature.

*Seetha Singh*

Signature of Asst/Asso. Professor