

Govt. College, Bherian (Pehowa)

Lesson Plan

September 2023 to December 2023 (Odd Semester)

MDC- Chemistry Ist Semester

Ms. Prerna

Subject : Chemistry

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| Week 1 | |
| 18 September to 23 September | Atomic Structure and Bonding Introduction, Elementary introduction of atomic structure and chemical bonding, Representation of elements/ atoms |
| Week 2 | |
| 25 September to 30 September | Lewis structure, electronic configurations (1-15) electronic configurations (16-30) |
| Week 3 | |
| 2 October to 7 October | Carbon and Its Compounds Introduction, Tetravalency of Carbon, allotropes of carbon and their properties, |
| Week 4 | |
| 9 October to 14 October | hydrocarbons (1-5), nomenclature (linear compounds), Applications of hydrocarbons |
| Week 5 | |
| 16 October to 21 October | Polymers Introduction, elementary idea of synthetic and natural polymers, Homo polymers and copolymers, |
| Week 6 | |
| 23 October to 28 October | uses and properties of (Natural rubber, Vulcanized rubber, Polyethene, PVC, Styrene, |
| Week 7 | |
| 30 October to 4 November | uses and properties of Teflon, PAN, Nylon-66 Practice of MCQ on polymer Test-1 |
| Week 8 | |
| 6 November to 9 November | Revision of chapter Carbon and its compounds Oral test |
| Week 9 | |
| 10 November to 16 November | Diwali Break |

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| Week 10 | |
| 17 November to 18 November | Food Preservatives Elementary idea of natural and synthetic food preservatives, rancidity |
| Week 11 | |
| 20 November to 25 November | uses and properties of food preservatives, different food preservation processes (pickle, Jam etc. |
| Week 12 | |
| 27 November to 2 December | Practical 1: Identify the pH of the given samples through pH strip. Practical 2: Experiments related to preserving food items. |
| Week 13 | |
| 4 December to 9 December | Artificial sweeteners , their uses and properties Practical 3: To synthesize some polymers as per available resources. |
| Week 14 | |
| 11 December to 16 December | Practical 4: Preparation of Artificial Silk. Revision on chapter: food preservation |
| Week 15 | |
| 18 December to 23 December | Revision Revision Revision |

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Govt. College Bherian (Pehowa)
Lesson Plan

September 2023 to December 2023 (Odd Semester)

B.Sc. Chemistry Ist Semester

Ms. Prerna

Subject : Chemistry

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| Week 1 | |
| 4 September to 9 September | Structure of atom, de broglie wavelength, H.U.Principle atomic orbitals, orbit and orbital shapes of s, p, d, f and significance of wave function and probability function |
| Week 2 | |
| 11 September to 16 September | quantum numbers, orthogonal, orthonormal and normalised wave function Aufbau principle, Hunds rule and Pauli exclusion principle and examples Electronic configuration of elements |
| Week 3 | |
| 18 September to 23 September | Effective nuclear charge, Slater's rules, Numerical problems Introduction of periodic table, s, p, d, f block elements |
| Week 4 | |
| 25 September to 30 September | Periodic properties: Atomic radii, ionization energy Electronegativity and its different scales their trends in rows and columns |
| Week 5 | |
| 2 October to 7 October | Test 1 Electron affinity and its trends in rows and columns Discussion on conceptual questions and answers |
| Week 6 | |
| 9 October to 14 October | Radial and angular wave functions, Distribution curves Revision or discussion on last year question papers of completed chapters |
| Week 7 | |
| 16 October to 21 October | Kinetic theory of gases, Maxwell's distribution of velocities and energies (derivation excluded) Calculation of root mean square velocity, average velocity |
| Week 8 | |
| 23 October to 28 October | Collision diameter, collision number, collision frequency and mean free path |

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| Week 9 | |
| 30 October to 4 November | Deviation of Real gases from ideal behaviour, Derivation of Van der Waal' s Equation of State, |
| Week 10 | |
| 6 November to 9 November | Application of Van der Waal' s Equation of State IN calculation of Boyle' s temperature (compression factor) |
| Week 11 | |
| 10 November to 16 November | Diwali Break |
| Week 12 | |
| 17 November to 18 November | Concept of Critical temperature, critical pressure, critical volume, their measurements method |
| Week 13 | |
| 20 November to 25 November | relationship between critical constants and Van der Waal' s constants Numerical problems |
| Week 14 | |
| 27 November to 2 December | Revision or discussion on last year question papers of completed chapters |
| Week 15 | |
| 4 December to 9 December | Revision Revision |

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Govt. College Bherian (Pehowa)

Lesson Plan

August 2023 to November 2023 (Odd Semester)

B.Sc. Chemistry 3rd Semester

Ms. Prerna

Subject : Chemistry

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| Week 1 | |
| 1 August to 5 August | Introduction of coordination compounds |
| | werner's theory |
| | Chelating compounds, EAN rule |
| Week 2 | |
| 7 August to 12 August | Nomenclature of coordination compounds |
| | Isomerism in coordination compounds |
| | Optical isomerism in coordination compounds |
| Week 3 | |
| 14 August to 19 August | Valance bond theory, its postulates |
| | Valance bond theory examples, structures of coordination complexes |
| | Limitations of Valance bond theory |
| Week 4 | |
| 21 August to 26 august | Problems of chapter: Coordination compounds |
| | Physical properties of solvents |
| | General characteristics of solvents |
| Week 5 | |
| 28 August to 2 September | Class Test 1 |
| | Different types of solvents |
| | General reactions in non aqueous solvents |
| Week 6 | |
| 4 September to 9 September | Reactions in ammonia |
| | Reactions in Sulphur dioxide |
| | Discussion on conceptual questions of chapter: Non-aqueous solvents |
| Week 7 | |
| 11 September to 16 September | Indroductioin of d-block elements |
| | General properties of d-block elements |
| | Properties of 3d series |
| Week 8 | |
| 18 September to 23 September | Properties of 4d and 5d elements |
| | Comparison of properties of 3d, 4d and 5d series |
| | Stability of various oxidation states and e.m.f (Latimer and Frost diagrams) |
| Week 9 | |

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| 25 September to 30 September | Latimer and Frost diagrams and examples |
| | Structure and properties of some compounds of transition elements- TiO ₂ , VOCl ₂ |
| | Structure and properties of some compounds of transition elements- FeCl ₃ , CuCl ₂ and Ni(CO) ₄ |
| Week 10 | |
| 2 October to 7 October | Class Test 2 |
| | Introduction of chemical equilibrium |
| | Equilibrium constant and free energy, concept of chemical potential |
| Week 11 | |
| 9 October to 14 October | Thermodynamic derivation of law of chemical equilibrium. |
| | Temperature dependence of equilibrium constant |
| | Clausius-Clapeyron equation and its applications. |
| Week 12 | |
| 16 October to 21 October | Nernst distribution law – its thermodynamic derivation, |
| | Applications of distribution law: (i) Determination of degree of hydrolysis and hydrolysis constant of aniline hydrochloride |
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| Week 13 | |
| 23 October to 28 October | Determination of equilibrium constant of potassium tri-iodide complex |
| | Process of extraction. |
| | Numerical problems on applications of distribution law |
| Week 14 | |
| 30 October to 4 November | Revision of chapter: Chemical equilibrium |
| | Revision of chapter: Distribution law |
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| Week 15 | |
| 6 November to 9 November | Discussion on last year question papers of chapter: Coordination compounds |
| | Discussion on last year question papers of Inorganic chemistry: chemistry of d block |
| Week 16 | |
| 10 November to 16 November | Diwali Week |
| 17 November to 22 November | Revision |

June

Govt. College Bherian (Pehowa)
Lesson Plan

August 2023 to November 2023 (Odd Semester)

B.Sc. Chemistry 5th Semester

Ms. Prerna

Subject : Chemistry

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| Week 1 | |
| 1 August to 5 August | Introduction of coordination compounds |
| | Limitations of valence bond theory |
| | Crystal field theory |
| Week 2 | |
| 7 August to 12 August | Crystal field theory and its postulates |
| | Crystal field splitting of octahedral compounds |
| | Crystal field splitting of tetrahedral and square planar compounds |
| Week 3 | |
| 14 August to 19 August | factors affecting the crystal field parameters |
| | A brief outline of thermodynamic stability of metal complexes |
| | factors affecting the stability |
| Week 4 | |
| 21 August to 26 August | Irving William Series and kinetic stability |
| | Class test 1 |
| | Trans effect |
| Week 5 | |
| 28 August to 2 September | Theories of trans effect |
| | Substitution reactions of square planar complexes |
| | Type of magnetic materials |
| Week 6 | |
| 4 September to 9 September | Magnetic susceptibility |
| | LS coupling, and magnetic moment, Orbital contribution |
| | Applications of magnetic moment data |
| Week 7 | |
| 11 September to 16 September | Selection rules for d-d transitions |
| | Spectroscopic ground states |
| | Orgel energy level diagrams, |
| Week 8 | |
| 18 September to 23 September | Discussion of energy spectrum of $[Ti(H_2O)_6]^{+3}$ complex ion |
| | Black-body radiation, Plank's radiation law, photoelectric effect |
| | Class Test 2 |
| Week 9 | |
| | postulates of quantum mechanics, quantum mechanical operators |

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| 25 September to 30 September | commutation relations, Hamiltonian operator, Hermitian operator average value of square of Hermitian as a positive quantity, Role of operators in quantum mechanics |
| Week 10 | |
| 2 October to 7 October | To show quantum mechanically that position and momentum cannot be predicated simultaneously Determination of wave function & energy of a particle in one dimensional box Numerical problems of one dimensional box |
| Week 11 | |
| 9 October to 14 October | Revision of chapter: Quantum mechanics -I Optical activity, polarization, Clausius – Mossotti equation |
| Week 12 | |
| 16 October to 21 October | Orientation of dipoles in an electric field, dipole moment, induced dipole moment measurement of dipole moment -temperature method and refractivity method Dipole moment and structure of molecules, |
| Week 13 | |
| 23 October to 28 October | Magnetic permeability, magnetic susceptibility and its determination Applications of magnetic susceptibility magnetic properties – paramagnetism, diamagnetism and ferromagnetism |
| Week 14 | |
| 30 October to 4 November | Revision of chapter: Physical properties Discussion on last year question papers of Physical chemistry |
| Week 15 | |
| 6 November to 9 November | Discussion on last year question papers of Inorganic chemistry: Chapter 1 Discussion on last year question papers of Inorganic chemistry: Chapter 2 Discussion on last year question papers of Inorganic chemistry: Chapter 3 |
| Week 16 | |
| 10 November to 16 November | Discussion on last year question papers of Inorganic chemistry: Chapter 4 |
| 17 November to 22 November | Revision |
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