**LESSON PLAN (From October 2021 to January 2022)**

**NAME: Dr. Rekha Devi**

**CLASS: B.Sc. III Sem (Inorganic Chemistry) SECTION: Non-Medical**

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| Date | Contents |
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| Week 1, 1st Oct. 21 To 9th Oct. 21 | Definition of transition elements, position in the periodic table  General characteristic properties of d-Block elements  Comparison of properties of 3d elements with 4d and 5d elements with reference only to ionic radii, oxidation state |
| Week 2, 11th Oct. 21 To 16th Oct. 21 | Comparison of properties of 3d elements with 4d and 5d elements with reference magnetic.  Comparison of properties of 3d elements with 4d and 5d elements with reference magnetic and spectral properties.  Comparison of properties of 3d elements with 4d and 5d elements with stereo chemistry. |
| Week 3, 18th Oct. 21 To 23rd Oct. 21 | Discussion and solution of problems  Stability of various oxidation states and e.m.f (Latimer) |
| Week 4, 25th Oct. 21 To 30th Oct. 21 | Stability of various oxidation states and e.m.f (Frost diagrams)  Structure and properties of some compounds of transition elements- TiO2, VOCl2  Discussion and solution of problems. |
| Week 5, 8th Nov. 21 To 13th Nov. 21 | Structure and properties of some compounds of transition elements- FeCl3  Structure and properties of some compounds of transition elements- CuCl2 and Ni(CO)4  Assignment |
| Week 6, 15th Nov. 21 To 20th Nov. 21 | Coordination Compounds  Werner’s theory of coordination compounds  Effective atomic number, chelates |
| Week 7, 22nd Nov. 21 To 27th Nov. 21 | Nomenclature of coordination compounds  Discussion and solution of problems.  Isomerism in coordination compounds |
| Week 8, 29th Nov. 21 To 4th Dec. 21 | Valence bond theory of transition metal complexes  Valence bond theory of transition metal complexes |
| Week 9, 6th Dec. 21 To 11th Dec. 21 | Class test  Assignment |
| Week 10, 13th Dec. 21 To 18th Dec. 21 | Physical properties of solvents  Types of solvents |
| Week 11, 20th Dec. 21 To 25th Dec. 21 | General characteristics of solvents  Discussion and solution of problems.  Reactions in non aqueous solvents with reference to liquid NH3 |
| Week 12, 27th Dec. 21 To 1st Jan. 22 | Reactions in non aqueous solvents with reference liquid SO2.  Assignment of Non aqueous Solvents.  Discussion and solution of problems. |
| Week 13, 3rd Jan. 22 To 10th Jan | Discussion and solution of problems.  Revision of Coordination Compounds.  Revision of chapter transition elements. |

**LESSON PLAN (From October 2021 to January 2022)**

**NAME: Dr. Rekha Devi**

**CLASS: B.Sc. V Sem (Physical Chemistry) SECTION: Non-Med. and Med.**

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| Date | Contents |
| Week 1, 1st Oct. 21 To 9th Oct. 21 | Physical properties and molecular structure: Introduction, optical activity, definitions of different terms  Measurement of optical activity, optical activity and chemical constitution  Numerical problems on optical activity, Dipole moment: General Introduction  Electrical polarization of molecules, bond moments and group moments |
| Week 2, 11th Oct. 21 To 16th Oct. 21 | Clausius Mosotti Equation: General Introduction and derivation  Effect of temperature on polarization, measurement of dipole moment by Vapour-Temperature Method  Measurement of dipole moment by Refraction Method and Dilute Solution Method  Applications of dipole moment and numerical problems based on dipole moment |
| Week 3, 18th Oct. 21 To 23rd Oct. 21 | Magnetic Susceptibility: General Introduction and some terms involved  Measurement of magnetic susceptibility by Gouy's method, magnetic susceptibility and molecular structure  Explanation of diamagnetism and paramagnetism, determination of magnetic moment of paramagnetic substance, relationship between magnetic moment and number of unpaired electrons  relationship between molar magnetic susceptibility and number of unpaired electrons, applications of magnetic susceptibility |
| Week 4, 25th Oct. 21 To 30th Oct. 21 | Quick revision of the complete unit and doubts of students  Assignment and numerical problems related to complete chapter  Introduction to molecular spectroscopy, electromagnetic radiation, regions of electromagnetic spectrum  Differences between molecular spectroscopy and atomic spectroscopy, absorption and emission spectroscopy, experimental set-up |
| Week 5, 8th Nov. 21 To 13th Nov. 21 | Signal-to-noise ratio, resolving power  Types of molecular energies and Born Oppenheimer approximation, types of molecular spectra  Selection rules, width and intensity of the spectral lines  Degrees of freedom of motion, introduction to pure rotational spectra  Energy levels of a rigid rotor, rotational selection rules |
| Week 6, 15th Nov. 21 To 20th Nov. 21 | Rotational spectra of the diatomic molecules, relative intensities of rotational spectral lines  Types of molecules exhibiting rotational spectra, calculation of moment of inertia and bond length from rotational spectra, experimental details of microwave spectroscopy  Numerical problems on rotational spectra, non-rigid rotor, isotopic effect  Vibrational energy levels of a simple harmonic oscillator, selection rules for vibrational transitions in a simple harmonic oscillator |
| Week 7, 22nd Nov. 21 To 27th Nov. 21 | Vibrational spectra of a simple harmonic oscillator, types of molecules showing vibrational spectra  Vibrational energy levels of an n harmonic oscillator, selection rules for vibrational transition of an anharmonic oscillator,  Vibrational rotational spectra, P, Q and R branches of vibrational rotational spectra, intensities of lines in P and R branches |
| Week 8, 29th Nov. 21 To 4th Dec. 21 | Structural information from infrared spectroscopy, normal modes of vibration of polyatomic molecules  Isotopic effect on the vibration-rotation spectrum, vibrational frequencies of different functional groups  Numerical problems related to vibrational spectroscopy, Assignment  General introduction to Raman spectroscopy, explanation for observing Rayleigh line and Raman lines  Polarizability of molecules and Raman spectra, Quantum theory of pure rotational Raman spectra of diatomic molecules |
| Week 9, 6th Dec. 21 To 11th Dec. 21 | Quantum theory of rotational vibrational Raman spectra of diatomic molecules, advantages of Raman spectroscopy over infrared spectroscopy, experimental arrangement of Raman spectroscopy  Revision of complete spectroscopy with numerical problems |
| Week 10, 13th Dec. 21 To 18th Dec. 21 | Introduction to quantum mechanics, black body and black body radiations, Kirchhoff's law  Spectral distribution of black body radiations, explanation of spectral distribution on the basis of classical mechanics  Planck's radiation law and its derivation  Photo electric effect, heat capacity of solids |
| Week 11, 20th Dec. 21 To 25th Dec. 21 | Atomic and molecular spectra, origin of quantum mechanics, comparison of classical mechanics with quantum mechanics  relation between Quantum mechanics and classical mechanics, Bohr's model of atom with its defects  de-Broglie hypothesis, Heisenberg's uncertainty principle  The Compton effect, sinusoidal wave equation, |
| Week 12, 27th Dec. 21 To 1st Jan. 22 | Schrodinger wave Equation, eigen values and eigen functions, significance of wave function  Normalised and orthogonal wave function, operators, properties of hermitian operator  Postulates of quantum mechanics, role of operators in quantum mechanics, derivation of schrodinger wave Equation on the basis of postulates of quantum mechanics  Particle in one dimensional box problem, to show quantum-mechanical that position and momentum cannot be predicted simultaneously |
| Week 13, 3rd Jan. 22 To 10th Jan | Assignment of spectroscopy  Discussion and solutions to the problems |