**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 elementsComparison 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 problemsStability 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, VOCl2Discussion and solution of problems. |
| Week 5, 8th Nov. 21 To 13th Nov. 21 | Structure and properties of some compounds of transition elements- FeCl3Structure and properties of some compounds of transition elements- CuCl2 and Ni(CO)4Assignment |
| Week 6, 15th Nov. 21 To 20th Nov. 21  | Coordination CompoundsWerner’s theory of coordination compoundsEffective atomic number, chelates |
| Week 7, 22nd Nov. 21 To 27th Nov. 21 | Nomenclature of coordination compoundsDiscussion and solution of problems.Isomerism in coordination compounds |
| Week 8, 29th Nov. 21 To 4th Dec. 21 | Valence bond theory of transition metal complexesValence bond theory of transition metal complexes |
| Week 9, 6th Dec. 21 To 11th Dec. 21 | Class testAssignment |
| Week 10, 13th Dec. 21 To 18th Dec. 21 | Physical properties of solventsTypes of solvents  |
| Week 11, 20th Dec. 21 To 25th Dec. 21 | General characteristics of solventsDiscussion 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 termsMeasurement of optical activity, optical activity and chemical constitutionNumerical problems on optical activity, Dipole moment: General IntroductionElectrical polarization of molecules, bond moments and group moments |
| Week 2, 11th Oct. 21 To 16th Oct. 21 | Clausius Mosotti Equation: General Introduction and derivationEffect of temperature on polarization, measurement of dipole moment by Vapour-Temperature MethodMeasurement of dipole moment by Refraction Method and Dilute Solution MethodApplications 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 involvedMeasurement of magnetic susceptibility by Gouy's method, magnetic susceptibility and molecular structureExplanation of diamagnetism and paramagnetism, determination of magnetic moment of paramagnetic substance, relationship between magnetic moment and number of unpaired electronsrelationship 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 studentsAssignment and numerical problems related to complete chapterIntroduction to molecular spectroscopy, electromagnetic radiation, regions of electromagnetic spectrumDifferences 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 powerTypes of molecular energies and Born Oppenheimer approximation, types of molecular spectraSelection rules, width and intensity of the spectral linesDegrees of freedom of motion, introduction to pure rotational spectraEnergy 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 linesTypes of molecules exhibiting rotational spectra, calculation of moment of inertia and bond length from rotational spectra, experimental details of microwave spectroscopyNumerical problems on rotational spectra, non-rigid rotor, isotopic effectVibrational 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 spectraVibrational 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 moleculesIsotopic effect on the vibration-rotation spectrum, vibrational frequencies of different functional groupsNumerical problems related to vibrational spectroscopy, AssignmentGeneral introduction to Raman spectroscopy, explanation for observing Rayleigh line and Raman linesPolarizability 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 spectroscopyRevision 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 lawSpectral distribution of black body radiations, explanation of spectral distribution on the basis of classical mechanicsPlanck's radiation law and its derivationPhoto 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 mechanicsrelation between Quantum mechanics and classical mechanics, Bohr's model of atom with its defectsde-Broglie hypothesis, Heisenberg's uncertainty principleThe 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 functionNormalised and orthogonal wave function, operators, properties of hermitian operatorPostulates of quantum mechanics, role of operators in quantum mechanics, derivation of schrodinger wave Equation on the basis of postulates of quantum mechanicsParticle 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 spectroscopyDiscussion and solutions to the problems |