Lesson Plan

B. Sc. III Year (Vth Semester)

Paper-XVI (CH-302) Physical Chemistry

Teacher name: Dr. Neha Aggarwal

October 2020

|  |
| --- |
| Quantum Mechanics-I Black-body radiation, Plank’s radiation law, photoelectric effect, postulates of quantum mechanics, quantum mechanical operators, commutation relations, Hamiltonian operator, Hermitian operator, average value of square of Hermitian as a positive quantity, Role of operators in quantum mechanics, To show quantum mechanically that position and momentum cannot be predicated simultaneously  |

November 2020

|  |
| --- |
| Determination of wave function & energy of a particle in one dimensional box. Physical Properties and Molecular Structure Optical activity, polarization – (Clausius – Mossotti equationderivation excluded ). 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 |

December 2020

|  |
| --- |
| , Magnetic permeability, magnetic susceptibility and its determination. Application of magnetic susceptibility, magnetic properties – paramagnetism, diamagnetism and ferromagnetism. Spectroscopy Introduction: Electromagnetic radiation, regions of spectrum, basic features of spectroscopy, statement of Born-oppenheimer approximation, Degrees of freedom. 25 Rotational Spectrum Selection rules, Energy levels of rigid rotator (semi-classical principles), rotational spectra of diatomic molecules , |

January2021

|  |
| --- |
| spectral intensity distribution using population distribution (Maxwell-Boltzmann distribution), determination of bond length and isotopic effect . Vibrational spectrum Selection rules, Energy levels of simple harmonic oscillator, pure vibrational spectrum of diatomic molecules, determination of force constant and qualitative relation of force constant and bond energy |

February 2021

|  |
| --- |
| idea of vibrational frequencies of different functional groups. Raman Spectrum Concept of polarizibility, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules, Quantum theory of Raman spectra |