# Third Year Fifth Semester

## Paper 502101 Physical chemistry 3 Credits,75 Marks(45hrs)

3 Hrs/Week

I. Elementary quantum mechanics 12 Hrs

Black body radiation,Planck's radiation law,photoelectric effect,Bohr's modes of hydrogen atom (no derivation) and its defects.De Broglie Hypothesis,the Heisenberg's uncertainty principles,Harmiltonian operator,Schrodinger wave equation and its importance,physical interpretation of the wave function,postulates of quantum mechanics.Schrodinger wave equation for H-atom,separation into three equations(without derivation),quantum numbers and their importance.

II. Spectroscopy 15Hrs

Introduction-Electromagnetic radiation,regions of the spectrum,basic features of different spectrometers,statement of the born-oppenheimerapproximation. Vibrational spectrum, rotational spectrum-diatomic molecules,energy levels of a rigid rotor(semi classical principles),selection rule,rotational spectra of rigid diatomic molecule,determination of bond length,numerical problems.

III. Photochemistry 08hrs

Introduction of radiation with matter,differencebetween thermal and photochemical processes.Law of photochemistry, Grothus-Drapper law,Stark-Einstein law,Jablonsiki diagram qualitative description of fluorescene,phosphorescence,non-radiative processes (internal conversion, intersystem crossing),quantum yield,photosynthesitized reactions.

IV. Physical properties and molecular structure 10Hrs

Optical activity and its measurement,dipole movement and its measurement by temperature change method,magnetic property and its measurement by Guoy balance method,applications of optical activity,dipole movement and magnetic property for determination of structure of molecule