COURSE-X I BSCCH 303 PHYSICAL CHEMISTRY- III

Block-1

Unit- 1 Elementary Quantum Mechanics

1.1 Objectives

1.2 Introduction

1.3 Black body radiation

1.4 Planck's radiation law

1.5 Photoelectric effect

1.6 Bohr's modes of hydrogen atom (no derivation) and its defects

1.7 Compton Effect.

1.8 de-Brogli Hypothesis

1.9 Heisenberg's uncertainty principles

1.10 Harmiltonian operator

1.11 Schrödinger wave equation and its importance (with derivation)

1.12 Physical interpretation of the wave function

1.13 Postulates of quantum mechanics

1.14 Schrodinger wave equation for H-atom,

1.15 Quantum numbers and their importance

1.16 Summary

1.17 Terminal Question

1.18 Answers

Unit- 2 Fundamentals of Spectroscopy

2.1 Objectives

2.2 Introduction

2.3 Introduction of Spectroscopy

2.4 Importance of Spectroscopy

2.5 The Electromagnetic Radiation

2.6 Regions of the spectrum

2.7 Basic features of different spectrometers

2.8 Difference between Atomic and molecular Spectroscopy

2.9 Absorption and Emission spectra

Block-2 Spectroscopic Methods-I

Unit- 3 Rotational Spectrum

Unit- 4 **Vibrational Spectra**

Unit- 5 Raman Spectroscopy

4.1 Objectives

4.2 Introduction

4.3 Concept of polarizavility

4.4 Selection rules

4.5 Pure rotational and pure vibrational Raman spectra of diatomic molecules

4.6 Summary

4.7 Terminal Questions

4.8 Answers

Unit- 6 Electronic Spectrum

5.1 Objectives

5.2 Introduction

5.3 Optical activity and its measurement

5.4 Dipole moment and its measurement by temperature change method

5.5 Magnetic property and its measurement by Guoy balance method

5.6 Applications of optical activity

5.7 Dipole moment and magnetic property for determination of structure of molecule

5.8 Summary

5.9 Terminal Questions

5.10 Answers

Unit- 7 Photochemistry

7.1 Objectives

7.2 Introduction

7.3 Introduction of radiation with matter

7.4 Difference between thermal and photochemical processes

7.5 Laws of photochemistry

7.6 Grothus - Drapper law

7.7 Stark-Einstein law

7.8 Jablonsiki diagram qualitative description of fluorescence

7.9 Phosphorescence

7.10 non-radiative processes (Internal conversion, Intersystem crossing),

7.11 Quantum yield

Block-3

Unit- 8 Solutions Dilute Solution and Colligative properties

Unit- 9 Thermodynamics III