

ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS),

VISAKHAPATNAM

VIII SEMESTER B.Sc. HONOURS CHEMISTRY Time:2hrs/week

Code CH8253(2) Revised Syllabus Under CBCS 2020-21 Marks: 50

Physical Chemistry: Quantum and Molecular Spectroscopy

PHYSICAL CHEMISTRY PRACTICALS –II

I

**Course Objective:** To train students in various instrumental methods of quantitative analysis

**Course Outcomes:**

On successful completion of this practical course, student shall be able to:

- List out, identify and handle various equipment in Chemistry lab.
- Learn and apply the concepts of electro chemistry in experiments.
- Be familiar with electro analytical methods and techniques which study an analyte by measuring the potential (volts) and / or current (amperes) in an electro chemical cell containing the analyte.
- Learn the procedures of preparation of standard solutions.
- Acquire skills in operation and calibration of instruments.

**II. Syllabus:**

1. Titration of mixture Strong acid and weak acid versus Strong base by conductometry.
2. Titration of Strong acid Vs Strong Base – pH – metry.
3. Titration of mixture of (NaHCO<sub>3</sub> + Na<sub>2</sub>CO<sub>3</sub>) VsHCl – pH- metry.
4. Titration of Strong acid Vs Strong Base using Quinhydrone electrode.
5. Titration of Fe<sup>+2</sup>Vs K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> – potentiometry
6. Verification of Beer-Lambert's law by Iron-thiocyanate system –colorimetry.
7. Determination of single electrode potential of Cu<sup>2+</sup>/Cu and estimate the given unknown concentration.

**III. Co-Curricular Activities**

**Mandatory:** (Lab /field training of students by teacher:(lab:10+field:05):

1. **For Teacher:** Training of students by the teacher in laboratory and field for not less than 15 hours on the field techniques/skills of handling the P H metry, potentiometry and colorimetry
2. **For Students:** Students shall visit a related industry/chemistry laboratory in universities/research organizations/private sector facility and observe the synthetic reactions. Write their observations and submit a hand written fieldwork/project work report not exceeding 10 pages in the given format to the teacher.
3. Max marks for Field work/project work Report: 05.
4. Suggested Format for Fieldwork/project work: Title page, student details, index page, details of place visited, observations, findings, and acknowledgements.
5. Unit tests (IE).

#### **IV. Reference books:**

1. Vogel's Text Book of Quantitative Chemical Analysis, J. Mendham, R. C. Denney, J. D. Barnes and M. J. Thomas, 4th & 6th Ed. (Pearson Education Asia).