# II B. Sc - SEMESTER –III: INDUSTRIAL CHEMISTRY THEORY PAPER –III

## Paper-III : CHEMICAL ANALYSIS

Total hours of teaching 60hrs @ 4 hrs per week

UNIT –I 12 Hours

**Errors:** Errors in chemical analysis, Errors in measurements, Accuracy, Precision, Statistical treatment of data, average, deviation and probability, rejection of results, significant figures.

**Solvent Extraction**: Introduction, Completeness of extraction, selectivity of extraction, recovery of extracted material, factors favoring solvent extraction, solvent extraction equilibrium, experimental measures, analytical applications.

UNIT -II 12 Hours

**Paper chromatography**: Introduction, theory of paper chromatography, operations involved in paper chromatography, quantitative paper chromatography, separation of amino acids, inorganic paper chromatography.

**Column Chromatography**: Introduction, theory, experiment technique and applications of column chromatography.

UNIT – III 12 Hours

**Thin Layer Chromatography**: Introduction, theory, technique and applications

Gas Chromatography: Introduction, instrumentation, apparatus and procedure.

UNIT –IV 12 Hours

**Potentiometric Measurements**: Introduction, instrumentation of potentiometric titrations, apparatus, procedure and applications, Potentiometric titrations.

**pH Measurements:** Introduction, electrometric determination of hydrogen, quinhydrone, antimony and glass electrodes.

UNIT – V 12 Hours

**Conductometric titrations**: Introduction, some fundamental relationships, equivalent and molar conductance, AC conduction, measurement of conductivity and applications of conductometric titrations.

**Visible Spectroscopy and colourimetry**: Nature of radiant energy, electromagnetic spectrum, Absorption methods and terms associated with absorption measurements, laws of absorption, Deviations of Beer's Law, Instrumentation with Special reference to spectophotometric applications of absorption spectroscopy, qualitative and quantitative, colourimetric determination of ammonia, phosphate, ion simultaneous determination of chromium and manganese in steel.

**Books for Reference:**Reference Books : Chemical Analysis By PC Jain and Srivastva

# II B.Sc INDUSTRIAL CHEMISTRY - SEMESTER-III
## Paper-III: PRACTICAL
## CHEMICAL ANALYSIS
Total hours of laboratory Exercises 30hrs @ 2 per week

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1. 1. POTENTIOMETRY: a. Determination of iron (II) with chromium (VI)
    a. b Determination of iron (II) with manganese (VII)
2. 2SPECTROPHOTOMETRY:
    a. Mapping of absorption spectra of aqueous solutions of chromium (VI) and manganese (VII)
3. COLOURIMETRY:
    a. Determination of nitrite in water.
    b. Determination of phosphate in water.
4. CONDUCTOMETRY :
    a. Determination of cell constant.
    b. Titration of a strong acid with a strong base.
    c. Titration of a weak acid with a strong base.
    d. Titration of a mixture of strong acid and weak acid with a strong base.
    e. Titration of a weak base with a strong acid.
5. PH METRY:
    A. Titration of HCl with NaOH.
    B. B. Titration of acetic acid with NaOH.
    C. d. Determination of pH of water samples.

Books Recommended:

1. Quantitative Inorganic analysis by A.I.Vogel.

2. Instrumentation methods of Chemical Analysis by Ewing

3. Vogel's text book of Quantitative Chemical Analysis by G.H. Jeffery, J. Bassett, J.Mendham, R.C.Denny

Practical examination pattern : practical 40marks,Recors +viva=10marks

# II B.Sc., INDUSTRIAL CHEMISTRY- SEMESTER -III
## MODEL PAPER III Chemical Analysis

Time: 3 hours maximum marks: 75

Answer any five questions 5 X 5 =25

1. Define accuracy and precession?
2. What are the factors favoring solvent extraction?
3. What is the theory involved in paper chromatography?
4. Write about retention time and volume ?
5. Write about Hydrogen Electrode?
6. Write about AC conduction?
7. Explain about Beer's Lambert's Law?
8. How TLC superior than paper chromatography?

Answer all questions 5 X 10 = 50

9. Explain about errors in chemical analysis? OR
   What are the experimental techniques of solvent extraction?
10. Discuss about the technique of paper chromatography? OR
    Explain the experimental technique of column chromatography?
11. Discuss about the technique of TLC ? OR
    Explain the instrumentation of Gas Chromatography?
12. What is the principle of potentiometer and explain the instrumentation ? OR
    Write about quinhydrone electrode and glass electrode?
13. Write about the conductometric titrations? OR
    Explain about the instrumentation of Spectro photo meter?