SEMESTER - II

Core Chemistry Practical I

INORGANIC QUALITATIVE SEMI MICRO ANALYSIS

Instructional Hrs : 45 **Sub. Code : 15CHUCP01**

Max. Marks : CIA-40; ESE-60 **Credits : 3**

Objective: To acquire the skill to analyze mixture of inorganic salts containing an interfering anion.Analysis of a mixture containing two cations and two anions of which one will be an interferring one. Semi micro method & using the conventional scheme.

CationsTo Be Studied: Lead – Copper – Iron - Zinc- Manganese – Cobalt – Nickel – Barium –Strontium - Magnesium - Ammonium.

Anions To Be Studied: Carbonate – Sulphate – Nitrate – Chloride- Bromide –Fluoride - Oxalate - Borate - Phosphate.

SEMESTER - IV

Core Chemistry Paper VI

Instructional Hrs : 45 **Sub. Code :15CHUC406**

Max. Marks : CIA-25; ESE-75 **Credits : 4**

Objective : To enable the students to have better understanding about metals , dyes, solutions and colligative properties.

UNIT I **9 Hrs.**

Iron Group Metals: Occurance – Extraction – Uses of Iron (cast iron) – Cobalt – Nickel - Platinum Group Metals - Isolation - Properties And Uses - Their Important Alloys - Platinum Black - Spongy Platinum - *Platinised Asbestos*.

UNIT II **9 Hrs.**

Color And Constitution: Relationship Of Color Observed To Wavelength Of Light Absorbed - Terms Used In Color Chemistry – *Chromophores* – *Auxochromes*- Bathochromic Shift - Hypsochromic Shifts - Color Of A Substance - Quinonoid Theory - Molecular Orbital Approach.

UNIT III **9 Hrs.**

Classification Of Dyes According To Chemical Constitution: Azo Dyes - Methyl Orange - *Bismark Brown* - Congo Red - Triphenyl Methane Dyes-Malachite Green - Crystal Violet - Phthalein Dyes – Phenolphthalein - Xanthene Dyes- Fluorescein - Anthraquinone Dyes - Mordant Dye – Alizarin – Vat Dye – Indigo.

UNIT IV **9 Hrs.**

Solutions:Ideal And Non-Ideal –Raoult's Law - Henry's Law –*Solubility Of*Patially M*iscible Liquids* – **Colligative Properties** : Relative Lowering Of Vapour Pressure - Elevation Of Boiling Point - *Depression Of Freezing Point* – Osmotic Pressure - Their Applications Nernst Distribution Law And Its Application.

UNIT V **9 Hrs.**

Nernst Distribution Law And*ItsApplication*.**Adsorption**: Types Of Adsorption-Adsorption Isotherms-FreundlichAdsoption Isotherm- Langmuir Adsorption Isotherm-BET Equation-(Elementary ideas only)Adsorption By Solids From Solutions-Gibbs Equation (Derivation Excluded)-Adsorption Isobars- Adsorption Isostere-Applications of Adsorption.

Note :*Italics* denotes Topics for Self Study

TEXT BOOKS

1.**Bhal B.S., Arunbahl**, *Advanced Organic Chemistry,* S. Chand & co., New Delhi, 19th Edition, 2006.,

2.**Puri B.R., Sharma L.R.,** Principles*Of Inorganic Chemistry,*ShobanialNaginchand & co., New Delhi, 26th Edition,2002.

4. **Puri, B.R., Sharma, L.R. Pathania M.S.,***ElementsOf Physical Chemistry,*Vishal Publshing co., Jalandhar, 4thEdition, 2013

REFERENCE BOOKS

1. **Arora M.G.,** *Text Book Of Dyes*, Anmol Publications, New Delhi, 1st Edition, 1996**Madan R.D.,***Modern Inorganic Chemistry*, S. Chand & co., New Delhi, 3rd Edition, 2011.

2.**Kheterpal Dr. S.C.,** *Physical Chemistry Vol. I & II,* Pradeep Publications, Jalandhar,9th Edition, 2011.

3.**Mughergee, S.M., Singh S.P., Kapoor R.P**., *Organic ChemistyVol– 1,2,3,* Wiley Eastern, New Delhi, 1st Edition, 1992.

4. **Kheterpal S.C.,** Physical Chemistry, Volume I, Pradeep Publications, Jalandhar, 2ndEdition,2004.

SEMESTER - IV

Core Chemistry Practical II

VOLUMETRIC AND ORGANIC ANALYSIS

Instructional Hrs : 45 **Sub. Code : 15CHUCP02**

Max. Marks : CIA-60; ESE-90 **Credits : 4**

Objective: Development of laboratory techniques. Acquisition of observation and analyzing skills.

I VOLUMETRIC ANALYSIS:

A. Acidimetry&Alkalimetry

1. Estimation Of Sodium Carbonate

B. Permanganometry

1. Estimation Of Ferrous Sulphate
2. Estimation of Oxalic Acid
3. Estimation Of Calcium-Direct Method

C. Dichrometry

1. Estimation Of Ferrous Iron Using Internal Indicator.

D. Iodimetry

1. Estimation Of Potassium Dichromate
2. Estimation Of Copper
3. Estimation OfArsenious Oxide

II ORGANIC ANALYSIS

Systematic Analysis Of An Organic Compound-Preliminary Testes - Detection Of Elements Present - Aromatic Or Aliphatic - Saturated Or Unsaturated - Nature Of The Functional Group - Confirmatory Tests And Preparation Of Derivatives

Compunds to be given: Aldehydes – Amines – Amides – Carbohydrates – Phenols-Acids – Esters - Nitro Compounds.

III Preparation:

Preparation involving bromination, acetylation, hydrolysis and oxidation.

SEMESTER - V

Core Chemistry Paper VII

INORGANIC CHEMISTRY

Instructional Hrs : 60 **Sub. Code : 15CHUC507**

Max. Marks : CIA-25; ESE-75 **Credits : 4**

Objective: To expose the students to the challenges of the subject and to unify many of the underlying principles and observed facts.

UNIT I **12 Hrs.**

Metallic bonding: Electron Sea Theory – Electrical – Optical Properties – Valence Bond Theory – Molecular Orbital Theory. **Alloys:**SubstitutionalAnd Interstitial Solid Solutions-Hume - Rothery Ratios -*Semiconductors -Intrinsic And Extrinsic - Uses*. **Metal Carbonyls:**Preparation – Properties – Uses – Structure of $CO_2(CO)_8$ – $Fe_2(CO)_9$ - $Mn_2(CO)_{10}$

UNIT II **12 Hrs.**

Artificial Radio Activity: Artificial Transmutations Of New Elements - Synthesis Of Radio Isotopes And Of Elements – Nuclear Fission And Fusion - Nuclear Reactors-Principles Of Working – Production Of Electrical Energy - *Atomic EnergyProjects In India* - Safety Measures - Disposal Of Reactor Wastes Pollution - Nuclear Reactions, Mechanism And Different Types Of Stellar Energy.

UNIT III **12 Hrs.**

Nature Of Isotopes And Isobars: Detection And Isolation Of Isotopes Various Methods - Importance Of Discovery Of Isotopes -*Uses Of Isotopes In VariousFields*– C-14 Dating - Nuclear Stability - N/P Ratio - Magic Numbers - Mass Defect - Nuclear Binding Energies - Radio Active Disintegration Series.

UNIT IV **12 Hrs.**

Acids And Bases: Definitions – Different Approaches - Protonic Acid – Base Systems – *Strengths Of Lewis Acids And Bases* – Solvolytic Reactions – Hard And Soft Acids And Bases – Acid And Base Strength Of HSAB - Applications Of HSAB Concept - Basis Of Hardness And Softness - Pi Bonding Contribution - Electro Negativities Of Hard And Soft Species - Limitations Of HSAB Concept.

UNIT V **12 Hrs.**

Solvents: Solubilities Of Compounds – Effect Of Temperature On Solubility – *Role Of Water As Solvent* – Chemical Structure And Solubility. Classification Of Solvents- General Behaviour - Properties Of Ionizing Solvents. Types Of Reactions In Solvents- Specific Non Aqueous Solvents- Protonic Solvents - Ammonia, HF – Non Protonic Solvents- SO_2, BrF_3 Molten Salt - Organic Solvents C_2H_5OH, Ether.

Note :*Italics* denotes Topics for Self Study

TEXT BOOKS

1. **Madan R.D.,***Modern Inorganic Chemistry,*Sultan chand& sons, New Delhi, Third Revised Edition, 2011.

2.**Puri B.R., Sharma L.R.,** *Principles Of Inorganic Chemistry,*ShobanialNaginchand & co., New Delhi, 26th Edition, 2002.

3**.Soni, P.L.,** *Inorganic Chemistry,* Sultan Chand & sons, New Delhi, 20th Edition, 1993.

REFERENCE BOOKS

1**. Cotton F.A.,***Concepts Of Inorganic Chemistry*, John Wiley & Sons, London, 3rd Edition, 2007.

2.**Manku,** *Theortical Inorganic Chemistry*, G.S.TataMegrow -Hill, New Delhi, 1st Edition, 1980.

3. **Shiver and Atkins,** *Inorganic Chemistry*, Oxford, New Delhi, 3rd Edition, 2002.

4**. Sundaram. S. and Srinivasan V.S.,** *Text Book Of Inorganic Chemistry- A New Approach*, Margham Publications, Chennai , 1st Edition, 1995.

SEMESTER V

Core ChemistryPaper VIII

ORGANIC CHEMISTRY

Instructional Hrs : 60 **Sub. Code : 15CHUC508**

Max. Marks : CIA-25; ESE-75 **Credits : 4**

Objective: To understand the relation between various facts, theories and mechanisms. To acquire the knowledge of the chemistry of organic compounds.

UNIT I **12 Hrs.**

Optical Activity Of Compounds With Asymmetric Carbon: Racemisation – Resolution –Asymmetric Synthesis- Configuration – D-L And R-S Nomenclature. (With One Asymmetric Carbon) Optical Activity Of Biphenyls – Allenes - *Spiranes* And Over Crowded Molecules.

UNIT II **12 Hrs.**

Mechanism Of Molecular Rearrangement Reaction: Pinacol- Pinacolone, Beckmann – Hoffmann – Curtius – Benzidine – *Schmidt* – *Lossen* – Cope - Benzylic Acid And Claisen Rearrangements.

UNIT III **12 Hrs.**

Carbohydrates: Chemistry And Structure Of Glucose – Fructose - Sucrose And Maltose (Cyclic Structure As Well) *Starch And Cellulose* – An Elementary Account (Elucidation Of Structure Not Necessary). **InterconversionOf Sugars:** Mutarotaion –Epimerization.

UNIT IV **12 Hrs.**

Amino Acids And Proteins Amino Acids: Classification – Preparation And Properties – Peptides And Polypeptides. **Proteins:** Classification Based On Physical Properties And Biological Functions- Primary - Secondary And Tertiary Structure - *Properties And Uses.*

UNIT V **12 Hrs.**

Heterocyclic Compounds: Preparation – Properties - Furan – Pyrrole – Thiophene - Pyridine – Comparison of basicity of Pyrrole and Pyridine - Quinoline – *Isoquinoline* - Indole - Isatin–Benzofuran.

Note :*Italics* denotes Topics for Self Study

TEXT BOOKS

1.**Bhal B.S., Arunbahl**, *Advanced Organic Chemistry*, S. Chand & co., New Delhi, 19th Edition, 2006.

2**. Soni P.L., Chawla H.M.,***Text book of organic chemistry*, Sultan & sons, New Delhi, 27th Edition, 1997.

REFERENCE BOOKS

1**.** **Finar I.L., Addison-Wesly Longman,***Organic Chemistry Volume 1*, ELBS, Londan6th Edition, 2000.

3**. Finar I.L, Addison-Wesly Longman***Organic Chemistry Volume II*, ELBS, London, 6th Edition, 1997.

4**. Kalsi,** *Stereo Chemistry Conformation And Mechanisms***,** Wiley Eastern Ltd., New Delhi, 3rdEdition, 1995.

5. **Morrison R.T and. Boyd. R.W.,***Organic Chemistry*, Prentice-Hall, New Delhi, 2ndEdition, 1969.

6**. Mughergee, S.M., Singh S.P., Kapoor R.P**., Organic*Chemisty, Vol– 1, 2, 3,* Wiley Eastern, New Delhi, 1st Edition, 1985.

SEMESTER - V

Core Chemistry Paper IX

ELECTRO CHEMISTRY

Instructional Hrs :75 **Sub. Code : 15CHUC509**

Max. Marks : CIA-25; ESE-75 **Credits : 4**

Objective: To learn the principles of electrochemistry and to understand its applications. To relate electrodes and electrode potentials in producing current. To familiarize the technique of polarography.

UNIT I **12 Hrs.**

Electrical Conduction: Conduction In Metals And In Electrolytic Solutions. Measurement Of Conductivity In Electrolytic Solution - Migration Of Ions- Kohlrausch's Law - *Arrhenius Theory Of Electrolytic Dissociation* – Oswald's Dilution Law - Theory Of Strong Electrolytes - Debye And Huckel - Onsagar Theory (Elementary Account Only) Verification – Debye - Falkenhagen Effect – Wien Effect - Transport Numbers – Determination – Conductometric Titrations.

UNIT II **12 Hrs.**

Ionic Equilibria: Solubility And Solubility Product - Determination Of Solubility Product - Applications Of Solubility Product - Principle - Dissociation Of Weak Acids And Bases - Dissociation Constants - pH Scale - Common Ion Effect - *Buffer Solution* – Determination Of pH Values Of Buffer Mixtures – Henderson Equation-Hydrolysis Of Salts – Degree Of Hydrolysis.

UNIT III **12 Hrs.**

Electrochemical Cells: Electrode Potentials - Single Electrode Potential - Standard Hydrogen Electrode -Determination And Significance Of Electrode Potentials - Kinds Of Electrodes And Their Potentials - Nernst Equation – EMF - Computation And Measurement Of Cell EMF -– – *Electrochemical Series Of Cell Reaction.*

UNIT IV **12 Hrs.**

Reference Electrodes : Electrodes For Measurement Of pH - Concentration Cells With And Without Transport - Liquid Junction Potential - *Applications Of EMFMeasurements* - Redox Potentials - Redox Indicators – Uses – Potentiometric Titrations.

UNIT V **12 Hrs.**

Fuel Cells: Hydrogen - Oxygen Cell And Hydrocarbon Oxygen Cell - Storage Cells – Lead Storage Cell And Nickel Cadmium Cell –Decomposition Voltage – Over Voltage - Deposition And Discharge Potential. **Polarography**: Principle- Concentration Polarization - *Dropping MercuryElectrode- $E_{1/2}$* Value.

Note :*Italics* denotes Topics for Self Study

TEXT BOOKS

1. **Kheterpal Dr. S.C.,** *Physical Chemistry Vol. I & II,* Pradeep Publications, Jalandhar, 2nd Edition, 2004.

2**. Puri B.R., Sharma L.R., Pathania M.S.,***Principles Of Physical Chemistry*, Sobanlal Naginchand& co., New Delhi, 19th Edition, 1987.

REFERENCE BOOKS

1. **Bahl B.S., Tuli, G.D., ArunBahl,***Essentials Of Physical Chemistry*,S. Chand & co., New Delhi, Revised Edition, 2009.
2. **Glasstone S., and Lewis D**., *Elements of Physical chemistry*, McMillan, New Delhi, 2nd Edition, 1970.
3. **Kapoor R.C., Aggarwal A.S.,** *Principles Of Polarography*, SathyaBhavan, Agra, 1st Edition, 1991.

2**. Soni P.L., Dharma Rao D.P.,***Text Book Of Physical Chemistry*, S. Chand &co., New Delhi, 12th Edition,1980.

SEMESTER - VI

Core Chemistry Paper X

PHYSICAL METHODS & CHEMICAL STRUCTURE

Instructional Hrs :75 **Sub. Code : 15CHUC610**

Max. Marks : CIA-25; ESE-75 **Credits : 4**

Objective: To appreciate the importance of internal structure of molecules and its impact on other properties. To utilize the variation in various properties to study the internal structure. To gain the knowledge of techniques used for structure determination.

UNIT I **12 Hrs.**

Magnetic Properties Of Molecules: Meaning Of The Terms Magnetic Susceptibility - Magnetic Moment - Diamagnetism - Para Magnetism – Ferromagnetism - *Determination Of Magnetic Susceptibility By Guoy's Method* –Application Of Magnetic Properties In Solving Structural Problems Involving Simple Ions And Co ordination compounds.

UNIT II **12 Hrs.**

Electrical Properties Of Molecules: Molar Polarization - Orientation Polarization And Distortion Polarization. **Polar And Non-Polar Molecules**: Determination Of Dipole Moments Of Polar Gases - Liquids – Solids - *Applications Of Dipole Moment In The Study Of Simple Molecules.*

UNIT III **12 Hrs.**

Spectroscopy: Absorption Spectra – Fundamental Concepts - Electromagnetic Spectrum - The Various Regions Of The Spectrum And The Relative Energies Of The Radiation In Each Region - Types Of Changes Induced By The Interaction Of Radiation With Matter - Theory Of Rotation Spectra - Molecular Rotation - Diatomic Molecule As Rigid Rotor - Intensities Of Spectral Lines - Applications Of Rotation Spectra – Bond Length - *Isotopic Substitution.*

UNIT IV **12 Hrs.**

IR Spectra : Theory - Simple Harmonic Oscillator Model-Information On Molecular Constitution From IR Spectra – Applications Of IR Spectra. **Raman Spectra**: *Theory - ComparisionOf IR And Raman Spectra*.

UNIT V **12 Hrs.**

UV And Visible Spectra: Theory **–** Franck - Condon Principle – Predissociation - Determination Of Dissociation Energies Using Bridge - Spooner Method - *Applications Of UV Spectra To Simple Molecules.* **NMR Spectra :**Basic Principles -Chemical Shift - NMR Spectra Of Simple Molecules. (High Resolution Details Not Expected). **ESR Spectra:** Basic Principles -'G' Factor Lande's Splitting Factor –ESR Spectrum Of Free Radicals H**.**, CH_3.

Note :*Italics* denotes Topics for Self Study

TEXT BOOKS

1. **Kheterpal S.C.,** *Physical Chemistry Vol. I & II,* Pradeep Publications, Jalandhar , 2nd Edition, 2004.
2. **Puri B.R., Sharma L.R.,Pathania M.S.,***Principles Of Physical Chemistry*, SobanlalNaginchand& co., New Delhi, 28th Edition, 2009.
3. **Soni P.L., Dharma Rao D.P.,***Text Book Of Physical Chemistry*, S.Chand& co., New Delhi, 12th Edition, 1980.

REFERENCE BOOKS

1. **Banwell C.N.,** Fundamentals*Of Molecular Spectroscopy,* Tata MC Graw Hill, New Delhi, 4thEdition, 2011.
2. **Barrow G.M.,***Introduction To Molecular Spectroscopy*, MCGraw Hill, New York, 1st Edition, 1962.
3. **Russel S.,***Physical Methods In Inorganic Chemistry*, Drago East west Press, 1st Edition, 1978.
4. **Sharma Y.R.,** Elementary *Organic Absorption Spectroscopy,* S. Chand & co., New Delhi, 1st Edition, 1980.

SEMESTER - VI

Core Paper - XI

CHEMICAL KINETICS

Instructional Hrs : 60 **Sub. Code : 15CHUC611**

Max. Marks : CIA-25; ESE-75 **Credits : 4**

Objective: To enable the students to acquire the knowledge regarding the principles of chemical kinetics and applying the same to solve the problems.

UNIT I **12 Hrs.**

Empirical Laws And Experimental Aspects: Rate Laws - Order - Molecularity Of Reactions - Setting Up And Solving Simple Differential Equations For First Order - Second Order - *Third Order* - Zero Order Reactions.

UNIT II **12 Hrs.**

Half - Life Period: First Order - Second Order - Zero Order- Third Order Reactions - Determination Of Order Of Reactions. **Experimental Techniques:***Volumetry* – Manometry – Dialtometry - Polarimetry – Colorimetry - Typical Examples For Each Of The Techniques.

UNIT III **12 Hrs.**

Theoretical Aspects I : Effects Of Temperature On The Rate Constant - The Activation Energy - The Collission Theory Of Reaction Rates And Its Limitation - The Theory Of Absolute Reaction Rates - *Comparision Of The Collision Theory With The Absolute Reaction Rate Theory* - Significance Of Free Energy Of Activation - Entropy Of Activation - Lindemann Theory Of Unimolecular Reactions.

UNIT IV **12 Hrs.**

Theoretical Aspects II: Complex Thermal Reactions –Reversible-Consecutive-Parallel &Thermal Chain Reaction –Kinetics of H_2/Br_2 Reaction.

Catalysis: Positive and Negative catalysis-Auto catalysis-General Characteristics of a Catalyst- Catalytic Promoters & Inhibitors- Homogeneous & Heterogeneous Catalysis (Kinetics of reactions not needed)- *Enzyme catalysis*.

UNIT V **12 Hrs.**

Kinetics Of Photochemical Reactions: Absorption Of Light And Photochemical Processes - The Stark – Einestein Law Of Photochemical Equivalence - Photochemical Chain Reaction - H_2/Br_2And H_2/Cl_2 Reactions - Quantum Yield Of Photochemical Reactions - Comparison Of Thermal & Photochemical Reactions - Photochemical Kinetics Of H_2/Br_2 Reaction - Photosensitized Reactions – Fluorescence *Phosphorescence* - Chemiluminescence.

Note :*Italics* denotes Topics for Self Study

TEXT BOOKS

1. **KheterpalS.C.,***Physical Chemistry*, Volume 1, Pradeep's Publications, 10th Edition 2012.
2. **Puri B.R, Sharma L.R., Pathania M.S.,***Principles Of Physical Chemistry*, SobanlalNaginchand& co., New Delhi, 44th Edition, 2010.

REFERENCE BOOKS

1. **Aleberty R.A.,***Physical Chemistry*, John-Wiley & sons, New York, 1st Edition, 1995.
2. **Bahl B.S., Tuli, G.D.,***Text Book Of Physical Chemistry*, S. Chand & co., New Delhi, Revised Edition, 2009.
3. **Bajpai D.N.,***Advanced physical chemistry*, S. Chand & co., New Delhi, 2nd Edition, 1998.
4. **Glasstone S., and Lewis D**., *Elements of Physical chemistry*, McMillan, New Delhi, 2nd Edition, 1970.
5. **Kundu, N. S. Jain, S.K.,***Physical chemistry*, Chand & co., New Delhi, 1st Edition, 1984.
6. **Soni P.L., Dharma Rao D.P.,***Text Book Of Physical Chemistry*, S.Chand&Co., New Delhi, 12th Edition, 1980.

SEMESTER - VI

Core Chemistry Paper XII

CHEMISTRY OF NATURAL PRODUCTS

Instructional Hrs : 60 **Sub. Code : 15CHUC612**

Max. Marks : CIA-25; ESE-75 **Credits : 4**

Objective: The syllabus is concise that encompasses important branches like chemistry of terpenoids, alkaloids, vitamins, hormones, steroids and chemotherapy. The main objective is to educate the students to gain a hold in the region of natural products chemistry.

UNIT I **12 Hrs.**

Terpenoids: Introduction – Classification – General Methods Of Isolation – Isoprene Rule - Structural Elucidation And Synthesis Of Geraniol – *Dipentene* – α Terpineol – α Pinene.

UNIT II **12 Hrs.**

Alkaloids: Introduction - Classifications – General Methods Of Determining Structures – Hoffmann's Exhaustive Methylation And Degradation - Structural Elucidation And Synthesis Of Nicotine - Coniine - *Piperine* - Papaverine.

UNIT III **12 Hrs.**

Vitamins: Definition - Classification - Sources- Deficiency Diseases Of VitaminA- Vitamin B – Vitamin C – Vitamin D – Vitamin E – Vitamin K - Importance Of Vitamin A In Vision (Rhodopsin Cycle) - Structural Elucidation And Synthesis –*Thiamine* – Ascorbic Acid.

UNIT IV **12 Hrs.**

Hormones: Introduction – Classification – Biological Functions – Structural Elucidation And Synthesis Of Adrenaline And *Thyroxine*. **Steroids:** Introduction – Chemistry And Structure Of Cholesterol (Synthesis Not Required).

UNIT V **12 Hrs.**

Chemotherapy: Introduction – Classification Of Drugs – Lethal Dose – Chemistry And Applications Of Sulpha Drugs - Anti Malarials – Life Cycle of Malarial Parasite - Analgesics - Amoebicidal Drugs And Antibiotics - Penicillin- Streptomycin – *Chloromycetin* - Tetracycline – (Structure And Uses Only).

Note :*Italics* denotes Topics for Self Study

TEXT BOOKS

1. **Agarwal O.P.,***Chemistry Of Natural Products Vol. 1 & 2,*Goel Publications, Meerut, 18th Edition, 1995.

2**. JayashreeGhosh**, *Fundamental concepts of Applied chemistry*, S. Chand & co., New Delhi, 1st Edition, 2006.

REFERENCE BOOKS

1. **Chatwal,***Chemistry of natural products I,* Himalya Publishing, Mumbai, 1st Edition, 1981.

2. **Chatwal,***Chemistry Of Natural Products II,* Himalya Publishing, Mumbai, 1st Edition, 1983.

3. **Morrison R.T and Boyd. R.W.,***Organic Chemistry,* Prentice-Hall, New Delhi, 6th Edition, 1997.

4. **Prof. Singh P.P &Dr.Rangnekar. D.W.,***Introduction To Synthetic Drugs,* Himalayam Publishing house, Mumbai, 1st Edition, 1980.

SEMESTER - VI

Core Chemistry Practical - III

GRAVIMETRIC ANALYSIS AND PHYSICAL CHEMISTRY

Practical Hrs : 105 **Sub. Code : 15CHUCP03**

Max. Marks : CIA-60; ESE-90 **Credits : 5**

Objective: To acquire the skill of analyzing the samples gravimetrically and to understand the principles of physical chemistry and also to apply them experimentally for determination of physical constants.

I GRAVIMETRIC ANALYSIS

1. Estimation Of Barium As Barium Sulphate
2. Estimation Of Barium As Barium Chromate
3. Estimation Of Lead As Lead Chromate
4. Estimation Of Calcium As Calcium Oxalate
5. Estimation Of Calcium As Calcium Carbonate

II PHYSICAL CHEMISTRY EXPERIMENTS

1. Determination Of Rate Constant Of Acid-Catalysed Hydrolysis Of An Ester (Methyl Acetate Or Ethyl Acetate).
2. Determination Of Rate Constant Of Inversion of Cane Sugar by Polarimetry
3. Determination Of K_f Molecular Weight By Rast Method-Naphthalene, Biphenyl, Biphenyl Amine As Solvents.
5. Determination Of Critical Solution Temperature Of Phenol Water System.
6. Determination Of Concentration Of An Electrolyte (NaCl / KCl/ Succinic Acid)
7. Determination Of Transition Temperature Of Sodium Acetate, Sodium Thiosulphate, And Strontium Chloride.
8. Phase Diagram-Simple Eutectic System.
9. Determination Of Cell Constant, Specific Conductance And Equivalent Conductance Of Strong Electrolyte.
10. Determination Of Dissociation Constant Of A Weak Acid (Acetic Acid)
11. Conductometric Titration, Strong Acid –Strong Base.
12. Potentiometric Titrations –Redox titrations
13. Verification of Adsorption Isotherms

ALLIED CHEMISTRY PRACTICALS

Instructional Hrs : 45 **Sub. Code : 15CHUAPO1**

Max. Marks : CIA-20; ESE-30 **Credits : 2**

Objective: To Acquire The Skill Of Analysing Samples Volumetrically.

To Learn The Technique Of Analyzing Organic Compounds.

I VOLUMETRIC ANALYSIS

1. Estimation Of Sodium Hydroxide Using Standard Sodium Carbonate
2. Estimation Of Hydrochloric Acid-Standard Oxalic Acid
3. Estimation Of Oxalic Acid –Standard Sulphuric Acid
4. Estimation Of Ferrous Sulphate-Standard Mohr's Salt Solution.
5. Estimation Of Oxalic Acid –Standard Ferrous Sulphate
6. Estimation Of Potassium Permanganate.

II ORGANIC ANALYSIS

1. Detection Of Elements (N, S And Halogens)
2. To Distinguish Between Aliphatic And Aromatic, Saturated And Unsaturated Compounds.
3. Functional Group Tests For Mono Hydric Phenol, Acids (Mono And Di), AromaticPrimary Amine, Amide, Diamide And Glucose. Systematic Analysis Of OrganicCompounds Containing One Functional Group And Characterization By Confirmatory Tests.