

**SEMESTER - I / III**  
**ALLIED CHEMISTRY PAPER-I**

**Instructional Hrs : 60**

**Sub. Code : 17CHUA101/17CHUA303**

**Max. Marks : CIA-20; ESE-55**

**Credits : 4**

**Objective:** To gain the knowledge of principles of chemistry. To understand the application of chemistry in industries.

**UNIT I**

**12 Hrs.**

**Chemical Bonding:** Molecular Orbital Theory – Bonding - Antibonding And Non-Bonding Orbitals - Molecular Orbitals - MO Configuration Of H<sub>2</sub>, N<sub>2</sub>, O<sub>2</sub>, F<sub>2</sub>. Bond Order Diamagnetism And Paramagnetism. **Interhalogen Compounds:** ICl - BrF<sub>3</sub> - IF<sub>5</sub> – Preparation – Properties - Uses. **VSEPR Theory And Geometry Of Molecules:** Hybridization And Geometry Of Molecules ICl - BrF<sub>3</sub> - IF<sub>5</sub> – CH<sub>4</sub> – SF<sub>6</sub>

**UNIT II**

**12 Hrs.**

**Fertilizers:** Need For Fertilizers – Role Of Primary And Secondary Nutrients In The Plant Growth – Inorganic Fertilizers - Urea - Ammonium Nitrate - Ammonium Sulphate - Superphosphate Of Lime - Triple Superphosphate. **Water:** Potability Of Water – Hardness Of Water – Determination Using EDTA -Treatment Of Water For Municipal Supply – Screening – Clarification - Coagulation – Sedimentation – Sterilization and Disinfection – Aeration - Chlorination.

**UNIT III**

**12 Hrs.**

**Organic Reactions and their Mechanism:** Homolytic Fission – Heterolytic Fission – Classification of Reagents – Electrophile – Nucleophile – Free Radical – Electron Displacement Effects - Inductive Effect – Mesomeric Effect. **Stereoisomerism:** Geometric Isomerism Of Maleic And Fumaric Acids - Optical Isomerism – Cause Of Optical Activity – Lactic Acid - Tartaric Acid – *Racemisation – Resolution.*

**UNIT - IV**

**12 Hrs.**

**Dye Chemistry:** Chromophore – Auxochrome - Bathochromic Shift - Hypsochromic Shift - Preparation And Uses – Azodye - Methyl Orange - Mordant Dye- Alizarin - Vat Dye - Indigo. **Chemotherapy:** Preparation - Uses And Mode Of Action Of Sulpha Drugs - Structure And

Uses Of Penicillin – *Chloromycetin* - Vitamins - Classification – Sources – Deficiency Diseases Of Vitamin A, B, C,D,E and K (Structure Not Necessary)

#### UNIT V

12 Hrs.

**Kinetics:** Rate – Order – Molecularity - Pseudo Unimolecular Reactions – Zero Order Reactions - Determination Of Order Of A Reaction - Effect Of Temperature On Reaction Rate – Arrhenius Activation Energy. **Chromatography:** Principle And Application Of Column - Paper - *Thin Layer Chromatography*.

**Note :** *Italics* denotes Topics for Self Study

#### TEXT BOOKS

1. **Dr. Veeraiyan V**, *Allied Chemistry Paper I & II*, Highmount Publishing House, Chennai, 2<sup>nd</sup> Edition, 2005.

#### REFERENCE BOOKS

1. **Bahl B.S., Arunbahl**, *Advanced Organic Chemistry*, S. Chand & co New Delhi 19<sup>th</sup> Edition, 2006.
2. **Bahl B.S. and Tuli, G.D.**, *Essentials Of Physical Chemistry*, S. Chand & co., New Delhi, 12<sup>th</sup> Edition, 2004.
3. **Puri B.R., Sharma L.R., Pathania M.S.**, *Principles Of Physical Chemistry*, Sobanlal Nagin chand & co., New Delhi, 28<sup>th</sup> Edition, 1987.
4. **Puri B.R., Sharma L.R.**, *Principles Of Inorganic Chemistry*, Shobanial Nagin chand & co., New Delhi, 26<sup>th</sup> Edition, 2002.
5. **Soni P.L.**, *Inorganic Chemistry*, Sultan chand & sons, New Delhi, 20<sup>th</sup> Edition, 1993.

**SEMESTER - II / IV**  
**ALLIED CHEMISTRY PAPER – II**

**Instructional Hrs : 60**

**Sub. Code : 17CHUA202/17CHUA404**

**Max. Marks : CIA-20; ESE-55**

**Credits : 4**

**Objective:** To motivate the students of other science subjects to learn and enjoy Chemistry. To relate chemistry to careers in science that interests students. To develop problem solving skills.

**UNIT I**

**12 Hrs.**

**General Methods Of Extraction Of Metals:** Types Of Ores - Method Of Ore Dressing - Reduction Methods - Electrical Methods - Types Of Refining - Van Arkel - Zone Refining. **Coordination Chemistry:** Co-ordination Number - Ligands – Monodentate – Bidentate - Nomenclature Of Complexes - Theories – *Werner* – Sidgwick - Pauling.

**UNIT II**

**12 Hrs.**

**Aromatic Compounds** - Electrophilic Substitution In Benzene - Mechanism Of Nitration – Halogenation - *Alkylation* - *Acylation* - Sulphonation – Isolation – Preparation - Properties And Structural Elucidation Of Naphthalene. **Heterocyclics:** Preparation And Properties Of Furan – Pyrrole - Thiophene And Pyridine.

**UNIT III**

**12 Hrs.**

**Amino Acids:** Classification - Preparation - Properties – Peptides – Dipeptide Synthesis. **Proteins:** Classification – Characteristics – Colour Reactions – Biological Functions - Structure  
**Carbohydrates** : Classification - Glucose And *Fructose* - Preparation – Properties - Open Chain Structure - Glucose - Fructose Interconversion.

**UNIT IV**

**12 Hrs.**

**Polymers:** Monomers – Polymers – Types Of Polymerization – Addition – Condensation Plastics - Thermo Setting – Thermo Plastics – Applications - Preparation And Applications Of PVC – Teflon – Polyesters – Buna –S Rubber – **Silicones:** Synthesis – Properties - Uses

**UNIT V**

**12 Hrs.**

**Electrochemistry** : Kohlrausch Law – Conductometric Titrations - Galvanic Cell - Standard Electrode Potential – Calculation Of EMF From Single Electrode Potential- Electrochemical

Series And Its Applications - pH And Its Determination By Conductivity Method – EMF method (Using Hydrogen Electrode Only) - *Buffer Solutions* And Its Importance In Biological Systems.

**Note : *Italics* denotes Topics for Self Study**

### **TEXT BOOKS**

1. **Dr. Veeraiyan V**, *Allied Chemistry Paper I & II*, Highmount Publishing House, Chennai, 2<sup>nd</sup> Edition, 2005.

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1. **Bhal B.S., Arunbahl**, *Advanced Organic Chemistry*, S. Chand & Co., New Delhi 19<sup>th</sup> Edition, 2006.
2. **Bahl B.S. and Tuli, G.D.**, *Essentials Of Physical Chemistry*, S. Chand & Co., New Delhi, 12<sup>th</sup> Edition, 2004.
3. **Jayashree Ghosh.**, *Applied Chemistry*, Sultan chand & sons, New Delhi, 1<sup>st</sup> Edition, 2006.
4. **Puri, B.R., Sharma, L.R. Pathania M.S.**, *Principles Of Physical Chemistry*, Sobanlal Nagin chand & Co., New Delhi, 28<sup>th</sup> Edition, 1987.
5. **Puri B.R., Sharma L.R.**, *Principles Of Inorganic Chemistry*, Shobanial Nagin chand & Co., New Delhi, 26<sup>th</sup> Edition, 2002.
6. **Sharma .B.K.**, *Industrial Chemistry*, Goel Publishing House, Meerut, 16<sup>th</sup> Edition, 2011.
7. **Soni P.L.**, *Inorganic Chemistry*, Sultan chand & sons, New Delhi, 20<sup>th</sup> Edition, 1993.
8. **Sivakumar R., Sivakumar N.**, *Engineering Chemistry*, Tata McGraw-Hill Publishing Company Limited, New Delhi, 1<sup>st</sup> Edition, 2008.