

SEMESTER - V
GROUP – A
Elective Paper I
PHARMACEUTICAL CHEMISTRY

Instructional Hrs : 60

Sub. Code : 17CHUE502

Max. Marks : CIA-25; ESE-75

Credits : 5

Objective: To motivate the students to know about the chemistry of drugs which utilizes the general laws of chemistry to study drugs.

UNIT I

12 Hrs.

Important Terminologies Used In Pharmaceutical Chemistry: Definition Of The Terms – Drug – Pharmacology - Pharmacognosy – Pharmacy- Therapeutics- Toxicology – Chemotherapy - Pharmacopoeia - B.P - I.P - U.S.P - E.P - LD₅₀ – Effective dose – National Formulary. **Immunological Agents:** Active - Passive Immunity – Vaccines– Toxoids – Routes Of Drug Administration. **First Aid:** Prevention Of Bleeding - Maintain Breathing - *Everyday Injuries*.

UNIT II

12 Hrs.

Food Poisoning: Botulism - Mushroom Poisoning – Plant Poisoning. **Causes, Symptoms And Treatment:** Anemia – Diabetes – Tuberculosis – Asthma – Jaundice – Piles – Leprosy – Epilepsy – Typhoid - Malaria And Cholera. **Indian Medicinal Plants:** Spices And Their Medicinal Uses – *Medicinal Plants In The Kitchen Garden*.

UNIT III

12 Hrs.

Hematological Agents: Blood Coagulants – Blood Clotting Factors – Anticoagulants – Fibrinolytic Agents – Antianaemic Drugs. **Blood** – Composition And Functions – Rh Factor – RBC – WBC – Basophiles – Eosinophils – *Plasma Proteins – Functions*.

UNIT IV

12 Hrs.

Chemotherapeutic drugs: Antibiotics – Antipyretics – Analgesics – Anaesthetics – Antiseptics And Disinfectants – Definition, Therapeutic Uses – *Distinction Between Antiseptics And Disinfectants*. **Important Drugs In Pharmaceutical Chemistry:** Aspirin – Chloramphenicol – Paracetamol – Gentamycin - Penicillin V – Erythromycin - Tetracycline – Uses And Common Side Effects.

UNIT V

12 Hrs.

Clinical Testing : Efficacy Of Drugs – Planning Clinical Trials - Diagnostic Test For Sugar In Urine - Salts In Serum And Urine – Cholesterol In Urine – *Detection Of Diabetes* – Estimation Of Hb Concentration.

Note : *Italics* denotes Topics for Self Study

TEXT BOOKS

1. **Jayashree Ghosh**, *A Text Book Of Pharmaceutical Chemistry*, S.Chand & Co., New Delhi, 3rd Edition, 2008.

REFERENCE BOOKS

1. **Ashutosh Kar**, *Medicinal Chemistry*, New Age International, New Delhi, 1st Edition, 1992.
2. **Betleys, Raubins E.A.**, *Text Book Of Pharmaceutics*, All India traveler book sellers, Delhi, 8th Edition, 1992.
3. **Satoskar R.S., Bhandarkar S.D.**, *Pharmacology And Pharmatherapeutics, Vol 1&2*, Popular prakashan, Mumbai, 11th Edition, 1989.

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 H₂, N₂, O₂, F₂. Bond Order Diamagnetism And Paramagnetism. **Interhalogen Compounds:** ICl - BrF₃ - IF₅ - Preparation – Properties - Uses. **VSEPR Theory And Geometry Of Molecules:** Hybridization And Geometry Of Molecules ICl - BrF₃ - IF₅ – CH₄ – SF₆

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, 2nd Edition, 2005.

REFERENCE BOOKS

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

SEMESTER - III
Skill Based Subject I
CHEMISTRY OF MILK AND MILK PRODUCTS
(CAFETERIA SYSTEM)

Instructional Hrs : 45

Sub. Code: 17CHUS301

Max. Marks : CIA-25; ESE-75

Credits : 3

Objective: To acquire a comprehensive knowledge on milk and milk products required for practical and systematic quality control programme in dairy plants.

UNIT I

9 Hrs.

Importance Of Dairy Industry: Milk – Definition – Composition Of Milk – Water In Milk – Dry Matters – Milk Fat – Milk Protein – Whey Protein – Milk Sugars – Mineral Matters - Minor Constituents – Cholesterol- Pigment- Enzymes- Vitamins- *Factors Influencing The Gross Composition Of Milk* – Variation To Species Of Animal – Breed – Stage Of Lactation - Seasonal Variations - Interval Between Milking - Effect Of Feed Upon Milk.

UNIT II

9 Hrs.

Physical Properties Of Milk: Colour - Flavor And Aroma – Acidity – Natural & Developed – Specific Gravity – Recknagel Effect – Viscosity And Conductivity. Physio- Chemical Change Taking Place In Milk Due To Processing Parameters Like –Boiling- Pasteurization – *Sterilization And Homogenization* - Fermentation Of Milk - Souring.

UNIT III

9 Hrs.

Milk Products: Cream – Definition – Composition – Chemistry - Creaming Process Butter – Composition – Process Of Manufacture - Ghee – Major Constituents – Common Adulterants Added To Ghee – Rancidity – Paneer and Cheese – Classification – Composition- *Ice Cream* – *Composition of Ice Cream* – Role Of Stabilizers And Emulsifiers- .

UNIT IV

9 Hrs.

Non Fermented Milk Products: Condensed Milk - Composition – Methods Of condensing - Milk Powder – Definition – Process Of Drying Milk - Spray Drying – *Drum Drying* - Types Of Dry Milk – Uses Of Dry Milk – Defects Of Dry Milk – Marketing Of Dry Milk - Dairy Detergents – Definition – Classification – Sanitizers – Chloramin T – Sodium Hypochlorite.

UNIT V

9 Hrs.

Sampling Of Milk: Significance Of Lactose In Milk And Milk Products - Determination Of Lactose Content In Milk – Polarimetry Method - Chloramines - Determination Of Moisture And Total Solid Content Of Milk – Gravimetric Method Determination Of Fat And SNF Of Milk - Detection Of Added Water In Milk - *Detection Of Buffalo Milk and Cow Milk.*

Note : *Italics* denotes Topics for Self Study

REFERENCE BOOKS

1. **Bagavathi Sundari K.,** *Applied Chemistry*, MJP Publishers, Chennai, 1st Edition, 2006.
2. **Clarence Henry Eckles D.S., Willes Barnes com PSMA,** *Milk and milk products* , Tata MC Graw-Hill, New Delhi, 1st Edition, 2005.
3. **Ghatak P.K.,& Bandyophyay A.K.,** *Practical Dairy Chemistry*, Kalyani Publishers, New Delhi, 1st Edition, 2007.
4. **Jayashree Ghosh,** *Fundamental concepts of Applied chemistry*, S.Chand & Co., New Delhi., 1st Edition, 2006.
5. **MathurM.P., Dattaroy D., Dinakar P.,** *Text book & Dairy chemistry*, Indian Council and Agricultural Research, New Delhi, 1st Edition, 2005.

SEMESTER – IV
Skill Based Subject II
MULTISKILL DEVELOPMENT PAPER

Instructional Hrs : 45 **Sub Code : 17CHUS402**

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

Objective: To equip the students with knowledge on all topics as desirable from the point of view of brilliant success in the competitive examinations. To familiarize the students with various types of tests that are employed by the diverse examining bodies. To facilitate the students to communicate with confidence. To enhance their employability. To inculcate soft skills and to keep pace with the modern trend. To learn laboratory techniques with all precautions.

UNIT I

9 Hrs.

Communication: Question tag – Gerund and Infinitives – Spotting the errors – Vocabulary – Synonyms – Antonyms - Prepositions – Articles – One word substitution – Sentence completion.

UNIT II

9 Hrs.

Numerical Aptitude : Problems on numbers - Problems on Ages – Percentage - Profit and loss - Ratio & Proportion - Time & Work - Time & Distance - *Simple Interest* - Compound Interest.

UNIT III

9 Hrs.

Critical Reasoning : Logical Inference Questions and Syllogism.

Analytical Reasoning : Arrangement problems – Family / Blood Relation Qualms – Sense of Directions – Age Doubts.

Verbal Reasoning : Verbal Analogy (Letter series and number series only) – Coding and Decoding.

UNIT IV

9 Hrs.

MS Word: Creating A New Document – Working With Margins, Pages And Line Spacing – Page Numbering – Printing Documents – Biodata Preparation. **MS Excel:** Creating New Excel Work Book – Entering Data Into The Worksheets – Creating Charts – Bar Diagram – *Pie Chart*.

Presentation Skills: Creating Slides For Power Point – Adding Graphics To Slides – Effective Presentation.

UNIT V

9 Hrs.

Laboratory Techniques: Concentration Terms - Normal Solution – Molar Solution – Molal Solution – Percentage Solution – Weight Composition – Volume Composition - Preparation Of Standard Solution - Dilution Of Solution To Various Strength – Dilution Of Sulphuric, Nitric and Hydrochloric Acids –. Laboratory Accidents And *First Aid*

Note : Unit I, Unit II & Unit III evaluation will be through online examination - ESE

Italics denotes Topics for Self Study

REFERENCE BOOKS:

1. **Agarwal R.S.**, A Modern Approach to Verbal Reasoning (Fully Solved) –Revised Edition, S.Chand Company Limited, New Delhi, 2012. (Unit – III)
2. **Aggarwal, R.S.**, *Quantitative Aptitude*, S.Chand, 7th Edition, 2010. (Unit - II)
3. **Alkondan M.**, *Qualitative Analysis*, Nallamuthu Gounder Mahalingam College Students Co-operative Stores Ltd., Pollachi, 1st Edition, 1966.
4. **Balagurusamy E.**, *Programming is Ansi C*, Tata McGraw – Hill Publishing Company Limited , New Delhi, 3rd Edition, 2002.
5. **Edgar Thorpe**, *Test of Reasoning for Competitive Examinations* –Tata McGraw-Hill Publishing Company Limited, New Delhi, 4th Edition. (Unit – III)
6. **Hari Mohan Prasad & Uma Rani Sinha**. Objective English for Competitive Examinations. New Delhi: Tata McGraw Hill Education Private Ltd. (Unit – I), 2011.
7. **Jain T.S.Upkar's**, *SBI Clerical Cadre Recruitment Examination*. Agar Upkar Prakashan, 1st Edition, 2005.
8. **Karthikeyan T.**, *PC Software For Office Automation*, 1st Edition 2002.
9. **Muir G.G.**, *Hazards In The Chemical Laboratory* ,The Chemical Society, 17th Edition, 1977.
10. **Raman K. V.** *Computers in Chemistry* , Tata McGraw – Hill Publishing Company Limited New Delhi, 1st Edition, 2004.
11. **Venkateswaran V., Veeraswamy R., Kulandaivelu A.R.**, *Basic Principles Of Practical Chemistry*, Sultan Chand & Sons, 1st Edition, 1995.

SEMESTER - III

Non Major Elective - I

WATER MANAGEMENT-AN ENVIRONMENTAL PERSPECTIVE

Instructional Hrs : 30

Sub. Code : 17CHUN301

Max. Marks : ESE-100

Credits : 2

Objectives: To facilitate the students to have basic knowledge about the need to protect and nurture the precious bounty of freshwater, its socio-economic importance and conservation of water resources.

UNIT I

6 Hrs.

Water: Sources Of Water - Chemistry Of Water - Hardness Of Water - Water In Human Body - Quality Of Natural Water - Potability Of Water - *Water Cycle* - National Water Policy.

UNIT II

6 Hrs.

Socio- Economical Importance of Water: Demand And Consumption Of Water – Agriculture – Industry – Household – Recreation - Water Scarcity - Major Causes Of Water Quality Degradation - *Water Borne Diseases*.

UNIT III

6 Hrs.

Purification of Water: Clarification – Coagulation – Sterilization - Physical Methods -*Boiling* - *Exposure To Sunlight & UV Light* - Irradiation With Ultrasound - Chemical Methods - Aeration- Ozonisation – Chlorination - Softening By Zeolite Process - Sea Water As A Source Of Water.

UNIT IV

6 Hrs.

Sewage Treatment: *Purpose Of Sewage Treatment* – Composition - Properties – 1^o Treatment - 2^o Treatment - 3^o Treatment - Sludge Disposal.

UNIT - V

6 Hrs.

Conservation of water Resources: Need Of Water Harvesting Technologies - Recharging Of Ground Water - Rain Water Harvesting - Recycling Of Water - Artificial Rain - *How To Make Best Use Of Water*.

Note : *Italics* denotes Topics for Self Study

TEXT BOOKS

1. **Jat B.C, Sujan Singh**, *Water Management Through Traditional Technologies*, Pointer Publishers, Jaipur, 1st Edition, 2010.
2. **Sharma B.K.**, *Industrial Chemistry*, Krishna's Educational Publishers, New Delhi, 16th Edition, 2011.
3. **Sharma B.K.**, *Water pollution*, Krishna Prakashan Media (P) Ltd., Meerut, Vth Edition, 2012.

REFERENCE BOOKS

1. **Ahluwalia V.K.**, *Environmental Chemistry*, Ane Books Pvt. Ltd., New Delhi, 2nd Edition, 2013.
2. **Chandark K. Sharma**, *Introduction To Environmental Studies*, Vrinda Publications (P) Ltd., New Delhi, 1st Edition, 2010.
3. **De A.K.**, *Environmental Chemistry*, New Age International (P) Ltd Publishers, Delhi, 6th Edition, 2006.
4. **Dr. Punnia B.C, Arun Kumar Jain, Ashok Kumar Jain**, *Environmental Engineering- 2 Waste Water Engineering (Including Air Pollution)*, Laxmi Publications (P) Ltd., New Delhi, 2nd Edition, 1988.
5. **Raghunath H.M.**, *Ground Water*, New Age International Publishers, New Delhi, 3rd Edition, 2007.
6. **Santhosh Kumar Garg**, *Water Supply Engineering*, Khanna Publishers, New Delhi, 21st Edition, 2012.
7. **Santra S.C.**, *Environmental Science*, New Central Book Agency (P) Ltd., Kolkata, 2nd Edition, 2013.
8. **Stanley E. Manahan**, *Water Chemistry Green Science & Technology Of Nature's Most Renewable Resource*, CRC Press, New York, 1st Indian Reprint, 2015.