

7. **ALCOHOL DETERMINATION:** Alcoholometric methods, Problem during distillation of alcohol, Method for liquids containing less than 30% or more than 30% alcohol and special treatment before distillation.
8. **ALKALOIDAL DRUG ASSAY:** Weighing for assay, Extraction of drugs, Maceration, Percolation, Continuous extraction, Purification of Alkaloids and determination of alkaloids.
9. **QUALITY ASSURANCE OF VACCINES:** Introduction, Quality measures for stability of vaccines, potency testing, and post market surveillance of vaccines.
10. **MISCELLANEOUS DETERMINATIONS AND TESTS:** Determination of weight/ml, Water/Moisture content, Loss on Drying, Evaluation of Ointments, Ash contents and Alkalinity of Glass.
11. **STANDARDIZATION OF PHARMACEUTICALS:** An understanding of quality assurance system adopted in pharmaceutical industry. Good Manufacturing Practices and Current Good Manufacturing Practices.
12. **STATISTICAL INTERPRETATION OF QUALITY CONTROL CHARTS DURING MANUFACTURING PROCESSES:**

**PHARMACEUTICS-VI (PHARMACEUTICAL QUALITY MANAGEMENT) (Practical)**

**Paper 9**

**Marks 100**

**NOTE:** Practical of the subject shall be designed from time to time on the basis of the above mentioned theoretical topics and availability of the facilities e.g. Assay of various spirits, tinctures, extracts, syrups and elixirs, Assay of Ointments and suppositories, Assay of tablets and capsules, Test for alkalinity of glass, Determination of alcohol contents in the Pharmaceutical preparations and Pyrogen test. Sterility test, Determination of Ash contents, Determination of Moisture contents, Determination of total solids, Determination of viscosity of syrups, gels etc. Determination of emulsion types (Note: A minimum of 20 practicals will be performed).

**FINAL PROFESSIONAL**

**PHARMACEUTICAL CHEMISTRY-IV (MEDICINAL CHEMISTRY) (Theory)**

**Paper 1**

**Marks 100**

**NOTE:** The topics will be taught with special reference to their Pharmaceutical Applications.

1. **INTRODUCTION TO MEDICINAL CHEMISTRY:** Chemical constitution and biological activity: (Receptor, Theory, Structure Activity Relationships (SAR) and Drug Metabolism).

Modern concept of rational drug design, pro drug, combinatorial chemistry and computer aided drug design (CADD) and concept of antisense molecules.

**2. DRUG TARGETS AND DRUG DESIGNING:**

- a) Introduction and types of drug targets
- b) Introduction to molecular modeling and computational chemistry
- c) Structure based designing
- d) Ligand-based designing
- e) Various techniques in drug synthesis

**3. GENERAL PROPERTIES, CHEMISTRY, BIOLOGICAL ACTION, STRUCTURE ACTIVITY RELATIONSHIP AND THERAPEUTIC APPLICATIONS OF THE FOLLOWING:**

- a. Hormones: Steroidal Hormones (Testosterone, Progesterone, Estrogen, Aldosterone and Cortisol), Proteinous Hormones (Insulin, Glucagon, Oxytocin and Vasopressin).
- b. Anti-neoplastic Agents: Tamoxifen, Fluorouracil, Mercaptopurine, Methotrexate and Vincristine.
- c. Sedatives and Hypnotics: Benzodiazepines, Barbiturates, Paraldehyde, Glutethimide, Chloral hydrate, and alcohols.
- d. Anaesthetics: Local anaesthetics (Procaine, Lignocaine, Eucaine, Cocaine and Benzocaine), General anaesthetics (Cyclopropane, Halothane, Nitrous oxide, Chloroform, Thiopental Sodium, Ketamine, Methohexital, Thioamylal Sodium, Fentanyl Citrate, Tribromo ethanol).
- e. Analgesics and Antipyretics: Paracetamol, Salicylic acid analogues, Quinolines derivatives, Pyrazolone and Pyrazolodiones, N - arylanthranilic acids, Aryl and heteroaryl acetic acid derivatives.
- f. Sulphonamides: Prontosil, sulphanilamide, Sulphapyridine, sulphadimidine, Sulfamethoxazole, Sulfadiazine and Sulfafurazole.
- g. Antimalarials: 4-Aminoquinolines, 8-Aminoquinolines, 9-Amino acridines, Biguanides, Pyrimidine analogues, Mefloquine and Cinchona alkaloids.
- h. Diuretics: Mercaptopurine, Meralluride, Thiazides, Spironolactone, Theophylline, Furosemide, Acetazolamide, Ethacrynic acid and Triamterene.
- i. Antitubercular Drugs: Ethambutol, Isonicotinic acid, Hydrazid, Rifampicin, Thioguanine, Pyrazinamide, cycloserine, Ethionamide, Cytarabine, 5-Fluorouracil and Dacarbazine.
- j. Antiviral Drugs: Acyclovir, Tromantadine Hydrochloride and Ribavirin.
- k. Immunosuppressant Agents: Azathioprine and Cyclosporin.
- l. Antibiotics: Penicillins, Cephalosporins, Streptomycin, Chloramphenicol, Tetracyclines, Kanamycin and Erythromycin.

**PHARMACEUTICAL CHEMISTRY-IV (MEDICINAL CHEMISTRY) (Practical)**

**Paper 6**

**Marks 100**

**NOTE:** Practical of the subject shall be designed from time to time on the basis of the above mentioned theoretical topics and availability of the facilities e.g. Estimation of functional groups; Carboxylic, Hydroxy, Amino and Nitro groups; Determination of Molecular weights of Organic Compounds. Synthesis of Paracetamol, Salicylic Acid, Methyl salicylate, Azobenzene, Benzoic Acid, 5-Hydroxy-1, 3-benzoxazol-2-one, Aspirin, P-nitrosophenol, 3-nitrophthalic acid, Chloro-benzoic acid. Assay of the Drugs like Sulpha drugs, Aspirin, Paracetamol, Benzyl Penicillin. Inorganic Preparations (**Note:** A minimum of 20 practicals will be conducted).

**PHARMACY PRACTICE-VI (CLINICAL PHARMACY-II) (Theory)**

**Paper 2**

**Marks 100**

1. **RATIONAL USE OF DRUGS:** Rational Prescribing, Rational Dispensing, Problems of Irrational Drug Use, Learning about drug use problem, Sampling to study drug use, Indicators of drug use.
2. **INTRODUCTION TO ESSENTIAL DRUGS:** Criteria for selection, Usage and Advantages. Development of EDL.
3. **DRUG UTILIZATION EVALUATION & DRUG UTILIZATION REVIEW (DUE/DUR):** Development of protocol of use of few very low therapeutic index drug groups like Steroids, Vancomycin and Cimetidine.
4. **CLINICAL PHARMACOKINETICS:** Therapeutic Drug Monitoring of Digoxin, Theophylline, Gentamycin, Lithium, Phenytoin, Cabamazepine, Phenobarbitone, Valproic Acid, Cyclosporins and Vancomycin.
5. **PHARMACEUTICAL CARE, ITS SCOPE, MANAGEMENT AND APPLICATION OF CARE PLAN:**
6. **CLINICAL THERAPEUTICS:** General Strategy: Terminology of Disease. Management and Treatment. Drug Selection.
7. **CLINICAL TOXICOLOGY:**
  - (a) General information. Role of pharmacist in treatment of poisoning and general management of poisoning & over dosage. Role and Status of Poison Control Centre.
  - (b) Antidotes and their mechanism of action.
8. **SAFE INTRAVENOUS THERAPY & HAZARDS OF IV THERAPY**
9. **NON-COMPLIANCE:** Definition, introduction and importance, Extent of non-compliance, Methods of assessment, Reasons for non-compliance, Strategies for improving compliance.