

Syllabus for the Written Test

1) Pharmacognosy & Phytochemistry: Sources of Crude Drugs of Natural Origin and Their Classification; Factors Affecting the Cultivation of Medicinal and Aromatic Plants; Plant Growth Regulators; Adulteration and Types of Adulterants; Methods of Evaluation of Crude Drugs.

Definition, Classification, Properties, General Method of Extraction, Chemistry, Tests for Detection of Following Classes of Phytoconstituents: Alkaloids, Glycosides, Terpenoids (Volatile Oils, Resin and Resin Combinations), Tannins, Carbohydrates, Lipids, Proteins and Enzymes. Pharmacognostic Aspects of Crude Drugs Containing Aforesaid Classes of Phytoconstituents Covering Their Biological Source, Diagnostic Features, Chemical Constituents, Tests for Identification, Uses, Adulterants, Substituents and Allied drugs (If Any). Study of Fibres Used in Pharmacy: Cotton, Silk, Wool, Nylon, Polyesters, Glasswool and Asbestos.

Plant Tissue Culture: Types of Cultures, Nutritional Requirements, Growth and Their Maintenance. Applications of Plant Tissue Culture.

2) Pharmaceutical Chemistry

a) Biochemistry: Bimolecular Vitamins and Enzymes, Metabolism of Carbohydrates, Proteins, Lipids and Nucleic Acids.

b) **Medicinal Chemistry:** Introduction to Drug Design. Stereochemistry of Drug Molecules in Relation to Biological Activity. Structure, Nomenclature, Classification, Synthesis, SAR and mechanism of action of the Following Category of Drugs, Which Are Official in Indian Pharmacopoeia and British Pharmacopoeia: Hypnotics and Sedatives, Neuroleptics, Antidepressants, Anxiolytics, Anticonvulsants, Local Anaesthetics; Cardiovascular Drugs: Antianginal Agents, Vasodilators, Adrenergic and Cholinergic Drugs, Cardiotonic Agents, Diuretics, Antihypertensive Drugs and Antilipidemic Agents. Antihistaminics; Analgesics; NSAIDS; Hypoglycemic Agents; Anticoagulants; Antiplatelet Agents; Chemotherapeutic agents: Antibiotics, Antibacterials, Antifungal, Antiviral, Antimalarial, Anticancer and Antiamoebic Drugs; Drugs Affecting Hormonal Function.

c) **Inorganic pharmaceuticals:** Gastrointestinal Agents; Electrolytes; Haematinics; Topical Agents; Dental Products. Limit Tests for Arsenic, Iron, Lead, Chloride and Sulphate.

3) Pharmaceutics

a) **Physical pharmacy:** Matter and Properties of Matter; Micromeritics and Powder Rheology; Surface and Interfacial Phenomenon; Viscosity and Rheology; Dispersion Systems; Complexation; Kinetics and Drug Stability.

b) **Pharmaceutical Microbiology and Biotechnology:** Methods of Sterilization: Moist and Dry Heat, Filtration, Radiation and Gaseous; Sterility Testing; Media; Sampling; Neutralization of Various Antimicrobial Substances in Dosage Forms; Principles of Microbiological Assays. Principles of Immunology- Immunity; Classification of Immunity; Natural and Acquired Immunity; Manufacture and Standardization of Cholera, BCG, Polio and Rabies Vaccines; Diphtheria Toxoid, Tetanus Antitoxin. Monoclonal Antibodies- Preparation and Applications of antibiotics and hormones.

c) **Pharmaceutical Technology:** Preformulation Studies; Pharmaceutical Calculations; Formulation, Development, Packaging and Evaluation of: Liquid Dosage Forms, Semisolid Dosage Forms, Tablets, Capsules, Micro-Encapsulation, Aerosols, Parenteral Products, Ophthalmic Preparations, Suppositories, Blood products and Plasma Substitutes and Surgical Products; Cosmetic Preparations: Skin, Hair, Nails, Lips, Eye, Baby Care Products and Dentifrices.

d) Biopharmaceutics & Pharmacokinetics: Passage of Drugs Across Biological Barrier; Factors Influencing Absorption: Biological, Physico-Chemical, Physiological and Pharmaceutical. Basic Principles of Pharmacokinetics; Compartment Modeling: One Compartment Model with Reference to Intravascular and Oral Drug Administration, Concept of Clearance. Non-Linear Pharmacokinetics with Reference to One Compartment Model After I.V. Drug Administration; Bioavailability and Bioequivalence.

4) Pharmacology

a) General pharmacology: General Pharmacological Principles Including Toxicology; Pharmacology of Drugs Acting on Central Nervous System, Cardiovascular System (Including Diuretics), Autonomic Nervous System, Gastro Intestinal System and Respiratory System; Pharmacology of Autacoids: Histamine, Antihistaminic Drugs. 5-HT- its Agonists and Antagonists, Prostaglandins, Thromboxanes, and Leucotrienes. Steroidal and Nonsteroidal Anti-inflammatory Drugs. Pharmacology of Drugs Acting on Endocrine System: Thyroid Hormones and Antithyroid Drugs, Insulin, Oral Hypoglycemics, Estrogens, Progesterone and Oral Contraceptives, Androgens and Anabolic steroids. Chemotherapeutic Agents; Types of Bioassays, Bioassays of insulin, oxytocin, vasopressin, ACTH, d-tubocurarine, digitalis, histamine, 5-HT.

ImmunoPharmacology: Drugs Acting on the Blood and Blood Forming Organs.

b) Clinical Pharmacy: Therapeutic Drug Monitoring, Dosage Regimen in Renal and Hepatic Impairment. Drug-Drug Interactions and Drug-Food Interactions, Adverse Drug Reactions. Medication History and Review, and Patient counseling, clinical trials, types and phases of clinical trials including Good Clinical Practice.

c) Pathophysiology of common diseases: Parkinsonism. Schizophrenia. Depression, Stroke (ischemic and hemorrhage). Hypertension. Angina. Myocardial infarction, CCF. Atherosclerosis, Diabetes Mellitus, Peptic ulcer and inflammatory bowel disease. Cirrhosis and alcoholic liver diseases, Acute and chronic renal failure. Asthma and chronic obstructive airway diseases.

5) Pharmaceutical Analysis and Quality Assurance: Concepts of Qualitative and Quantitative analysis;

a) Fundamentals of Volumetric Analysis: Methods of Expressing Concentration, Primary and Secondary Standards, Standardization. Acid-Base, Oxidation-Reduction, Precipitation, Non-Aqueous and Complexometric Titrations and Gravimetric Analysis. Methods of Moisture Determination; Concept of Error, Precision, Accuracy, Specificity, Sensitivity, Detection Limit, Linearity and Range. Ruggedness; Calibration of Analytical Equipment.

b) Principles, Instrumental analysis and Applications of the Following: Absorption Spectroscopy (UV, 2 TG PGECET-2025 Visible & IR), Fluorimetry, Flame photometry, Refractometry, Polarimetry, Potentiometry, Conductometry and Polarography. Chromatographic methods; Paper, TLC, Column, GC and HPLC and Electrophoresis. RIA, ELISA and Pharmacopoeial Assays.

c) Quality Assurance and Quality Control Methods. Concept of GMP, GLP and GCP.

6) Pharmaceutical Jurisprudence: Pharmacy Act 1948; Drugs and Cosmetics Act 1940 and Rules 1945 and Amendments Thereto; Narcotic Drugs & Psychotropic Substances Act 1985 and Rules; Drugs Price Control Order.