

## Syllabus for Pharmaceutical Sciences or Pharmacy (SCPH23)

### Note:

- i. There will be one Question Paper which will have 100 questions.
- ii. All questions will be compulsory.
- iii. The Question Paper will have two Parts i.e. Part A and Part B
- iv. Part A will have 50 questions based on Research Methodology
- v. Part B will have 50 questions based on Subject-Specific Knowledge.

### Organic Chemistry

- General Principles
- Different classes of compounds
- Protection & deprotection of groups
- Aromaticity & chemistry of aromatic compounds
- Different aromatic classes of compounds
- Polycyclic aromatic hydrocarbons
- Carbonyl Chemistry
- Heterocyclic Chemistry
- Bridged rings
- Kinetic & thermodynamic control
- Stereochemistry
- Carbohydrates
- Amino Acids and Proteins
- Pericyclic reactions

### Physical Chemistry

- Composition and Physical States of Matter
- Colligative properties
- Thermodynamics
- Refractive Index
- Solutions
- Electrochemistry
- Ionic Equilibrium
- Kinetics

## **Physical Pharmacy**

- Matter
- Properties of Matter
- Micromeritics and powder rheology
- Surface and interfacial phenomenon
- Viscosity and rheology
- Dispersion systems
- Complexation
- Buffer
- Solubility

## **Pharmaceutical Chemistry**

- Pharmaceutical Chemistry is divided into two parts, i.e. Pharmaceutical Inorganic Chemistry and Medicinal Chemistry. Below are the topics that should be covered for the same.
- Pharmaceutical Inorganic Chemistry– Pharmaceutical Impurities, Monographs, Isotopes, Dentifrices, desensitizing agents, & anticaries agents.
- Medicinal Chemistry- Therapeutic classes of drugs, Various classes of therapeutic agents, Different classes of therapeutic drugs.

## **Pharmaceutics**

- Pharmacy Profession & Introduction to Pharmaceutics
- Introduction to dosage form
- Sources of drug information
- Allopathic dosage form
- Crude extract
- Allergenic extract
- Biological products
- Pharmaceutical Plant location, layout
- Dosage Form Necessities and Additives
- Powders
- Capsules
- Tablets
- Parenteral – product requiring sterile packaging.
- Suspensions
- Emulsions
- Suppositories
- Semisolids
- Liquids (solutions, syrups, elixirs, spirits, aromatic water, liquid for external uses)
- Pharmaceutical Aerosols

- Ophthalmic preparations
- Pre-formulations
- Stability of formulated products
- Prolonged Action Pharmaceuticals
- Novel Drug delivery system
- GMP and Validation
- Packaging Materials, Cosmetics
- Pilot plant scale-up techniques

### **Pharmacology**

- General Pharmacology
- Neurohumoral transmission in the autonomic and central nervous system
- Pharmacology of peripheral nervous system
- Pharmacology of central nervous System
- Pharmacology of cardiovascular system
- Drugs acting on the urinary system
- Drugs acting on Respiratory system
- Pharmacology of Endocrine system
- Chemotherapy
- Autacoids and their Antagonists
- Pharmacology of drug acting on the gastrointestinal tract
- Chrono pharmacology
- Immunopharmacology
- Vitamins & Minerals
- Principles of toxicology

### **Pharmacognosy**

- Introductory Pharmacognosy
- Classification of crude drugs
- Factors influencing the quality of crude drugs,
- Techniques in microscopy
- Introduction to phytoconstituents
- Principles of plant classification
- Pharmaceutical aids
- Animal products
- Plant products
- Toxic drugs
- Enzymes
- Homeopathic system of medicine
- Ayurvedic system of medicine
- Patents
- Plants based industries and research institutes in India.

- Herbal cosmetics
- Worldwide trade of crude drugs and volatile oils
- Phytopharmaceuticals

### **Pharmaceutical Analysis**

- Importance of quality control in pharmacy
- Oxidation-reduction titrations
- Non-aqueous titrations
- Precipitation titrations
- Complexometric titrations
- Gravimetry
- Extraction techniques
- Potentiometry
- Calibration
- General principles of spectroscopy
- Spectrofluorimetry
- Ultraviolet-visible Spectrometry
- Flame photometry & atomic absorption spectrometry
- Mass spectrometry
- Polarography
- Nephelometry & Turbidimetry
- Chromatography

### **Biochemistry**

- Cells
- Carbohydrates
- Proteins
- Lipids
- Vitamins
- Biological oxidations & reductions
- Enzymes
- Nucleic acids
- Hereditary diseases.

### **Biotechnology**

- Plant Cell and Tissue Culture
- Animal Cell Culture
- Fermentation Technology and Industrial Microbiology
- Recombinant DNA Technology, Biotechnology Derived Products

## **Microbiology**

- Sterilization & Disinfection
- Microbial Assay
- Introduction to Microbiology
- Microscopy and staining technique
- Biology of Microorganisms
- Fungi and Viruses
- Vaccines & Sera

## **Pathophysiology**

- Infectious diseases
- Hepatitis – Infective hepatitis
- Neoplastic diseases
- Basic principles of cell injury and adaptation
- Basic mechanisms of inflammation and repair
- Disorders of fluid
- Electrolyte and acid-base balance
- Immunopathology including amyloidosis.
- Pathophysiology of common diseases
- Laboratory tests for Liver function tests and kidney function tests

## **Biopharmaceutics and Pharmacokinetics**

- Bioavailability & Bioequivalence
- Quality parameters of dosage forms
- Biopharmaceutics
- Assay methods & their validation
- Biopharmaceutical statistics

## **Clinical Pharmacy and Therapeutics**

- Drug interaction in pediatric and geriatric patients, drug treatment during pregnancy, lactation and menstruation.
- Pharmacovigilance, Therapeutic drug monitoring, Nutraceuticals, essential drugs, and rational drug usage.
- Drug therapy for neurological and psychological disorders.
- Drug therapy in infections of the respiratory system, urinary system, infective meningitis, TB, HIV, malaria, and filaria.
- Drug therapy for thyroid and parathyroid disorders, diabetes mellitus, menstrual cycle disorders, menopause, and male sexual dysfunction.

- General Principles, preparation, maintenance, analysis of observational records in clinical Pharmacy.
- Clinical trials, type, and phases of clinical trials, placebo, ethical and regulatory issues including Good clinical practice in clinical trials.
- Therapeutic drug monitoring, adverse drug reaction (ADR), types of ADR, Mechanism of ADR. Drug interaction, Monitoring, and reporting of ADR and its significance.
- Drug information services, Drug interactions.
- Age-related drug therapy: concept of posology, drug therapy for neonates, pediatrics, and geriatrics. Drugs used in pregnancy and lactation.
- Drug therapy in gastrointestinal, hepatic, renal, cardiovascular, and respiratory Disorders.
- Drug therapy for malignant disorders like leukemia, lymphoma, and solid tumors.
- Drug therapy for rheumatic, eye, and skin disorders.

### **Human Anatomy and Physiology**

- Cell physiology
- The Blood
- Gastrointestinal tract,
- Respiratory System
- Autonomic nervous system
- Sense organs
- Skeletal System
- Central Nervous system
- Urinary System,
- Endocrine Glands
- Reproductive System
- Cardiovascular system
- Lymphatic system

### **Pharmaceutical Engineering**

- Size reduction and size separation
- Extraction
- Mixing
- Crystallization
- Fluid flow,
- Heat transfer
- Filtration and Centrifugation
- Dehumidification and humidity control
- Evaporation

- Distillation
- Drying
- Refrigeration and air conditioning
- Industrial hazards & safety precautions
- Material of constructions
- Automated process control systems

### **Pharmaceutical Management**

- Communication,
- Marketing Research
- Leadership and motivation
- Human resource and development (HRD),
- GATT
- World trade organization (WTO) and trade-related intellectual property rights (TRIPS)
- Introduction to management
- Planning and Forecasting
- Organization
- Research Management
- Inventory Management
- Standard institutions and regulatory authorities
- Bureau of Indian Standards (BIS)