

Syllabus of Ph.D. Entrance Examination

24. Pharmaceutical Science

Medicinal Chemistry

Structure, nomenclature, classification, synthesis, SAR and mechanism of action of the following categories of drugs, which are official in Indian pharmacopoeia and British pharmacopoeia. Analgesics, Antidepressants, Anxiolytics, Neuroleptics, Hypnotics and sedative, Anticonvulsants, Antihistaminics, Local anaesthetics, Antianginal agents, Cardiotonic agent, Diuretic, Anticoagulants, Coagulants, Antihypertensive drugs, Adrenergic and Cholinergic drugs, Hypolipidemic agents, Hypoglycemic agents, Antiplatelet agent, Antibiotics, Antibacterials, Antiprotozoal drugs, Sulphonamides, Antimalarial, Antiviral, Antitubercular, Antimoebic drugs, Anticancer drugs, Antihelminthic agents. Introduction to drug design. Stereochemistry of drug molecules.

Pharmacognosy and Phytochemistry

Chemical tests for identification, chemistry, isolation, characterizations and estimation of phytopharmaceuticals belonging to the groups of terpenoids, steroids, Bioflavanoids, Purines, Alkaloids, Guggul lipids, Glycosides. Pharmacognosy of crude drugs that contain the above constituents.

Standardization of raw materials and Herbal products, WHO guideline quantitative microscopy including modern techniques used for evaluation, Biotechnological principles and techniques for plant development, tissue culture. Marine drugs, Nutraceuticals, Photosensitizing agents, Classification system of Plant drugs and Chemotaxonomy, Biosynthetic pathways, Factors affecting variability of drugs phyto constituents.

Pharmaceutics

Physical, Chemical, therapeutic incompatibilities and its rectification methods. Formulation, preparation and quality control of tablets, capsules, liquid dosage forms, parental preparations, ointment and creams, suppositories, and controlled release product, Quality control of containers, closers, caps, and secondary packing material like paper and board for pharmaceuticals. Storage of different dosage forms. Different methods of sterilization and evaluation of sterile products, sterility testing of pharmaceutical products e.g. sera, vaccines. New drug delivery systems. Biopharmaceutics and their importance in formulations.

Pharmacology

Pharmacology of Autocoids, Harmones, Hormone antagonists, Chemotherapeutic agents including Anticancer drugs, Bioassays, Immuno Pharmacology, General Pharmacological Principles including toxicology, Drug interaction. Pharmacology of drug acting on central nervous systems, cardiovascular systems, Autonomic nervous systems, Gastro intestinal systems and Respiratory systems, Drug acting on the renal systems, Drug acting on the blood and blood forming organs.

Pharmaceutical Analysis

Principles, Instrumentation and applications of the following,
Absorption

spectroscopy UV visible, IR, Flamephotometry, Potentiometry, Fluorimetry, Conductometry, Polarimeter and Polarography, Pharmacopoeial assays. Principles of NMR, Mass spectroscopy,

X-ray diffraction and different chromatographic techniques.
Quality control of Radio pharmaceuticals.

Microbiology

Principles and methods of microbiological assays as per Indian pharmacopoeia, methods of preparations of official sera and vaccines, Serological and diagnostics tests, Enzymes immune-assay, concept and methodology, Sterility testing methodology and interpretation, Applications of microorganisms in Bioconversions and in pharmaceutical industry.

Biochemistry

Metabolism of Carbohydrates, lipids, proteins, methods to determine kidney, liver function and Lipid profiles. General principles of immunology, Biochemical role of Hormones, Vitamins, Enzymes and Nucleic acids.

Pharmaceutical Jurisprudence

Pharmaceutical Ethics, Pharmacy Acts, Drugs and Cosmetics Acts and rules with respect to manufacture, sales and storages.