

Harcourt Butler Technical University, Kanpur

**Syllabus of Written Examination for the Faculty Recruitment
Assistant Professor (on Contract)**

**PHARMACEUTICAL SCIENCES
PHARMACEUTICS/ PHARMACOGNOSY**

UNIT-I

Microbiology in pharmacy; microbial contamination and control; sterilization and aseptic techniques; preservation of pharmaceutical products; immunology and immunological preparations; vaccines and sera; genetic recombination and biotechnology; applications of microorganisms in pharmaceutical sciences.

Unit operations and unit processes; stoichiometry; material handling systems; materials of construction; corrosion; heat transfer; evaporation; distillation; drying; filtration; centrifugation; mixing; plant location and layout; industrial hazards and safety precautions; automated process control systems; Good Manufacturing Practices (GMP); validation; quality assurance.

Preformulation studies; formulation, design and evaluation of liquid dosage forms, semisolid dosage forms and suppositories; extraction and galenical products; tablets, tablet coating and capsules; microencapsulation and novel drug delivery systems; pharmaceutical aerosols; ophthalmic preparations; parenteral products; surgical products; blood products and plasma substitutes; cosmeticology and cosmetic preparations; packaging of pharmaceutical products; quality control and performance evaluation methods.

UNIT-II

Drug absorption, distribution, metabolism and excretion; pharmacokinetic models; compartmental and non-compartmental analysis; clinical pharmacokinetics; bioavailability and bioequivalence; dosage regimen design; therapeutic drug monitoring; factors affecting drug disposition.

Prescription and non-prescription products; dispensing pharmacy; community pharmacy; hospital pharmacy organization and management; drug galenical products information services; patient medication records and reports; pharmacoepidemiology; pharmacovigilance; nuclear pharmacy; pharmaceutical jurisprudence and ethics; Drugs and Cosmetics Act and Rules; Pharmacy Act; medicinal and narcotic drug regulations.

UNIT-III

Sources, classification and identification of crude drugs; cultivation, collection, processing, storage and preservation of crude drugs; quality control and evaluation of crude drugs; adulteration and detection of adulterants; WHO guidelines for herbal drug standardization; pharmacognostic, microscopic and phytochemical evaluation of crude drugs.

Study of medicinally important plants; biological sources, cultivation, diagnostic characteristics, chemical constituents and therapeutic uses of medicinal plants.

UNIT-IV

Occurrence, distribution, chemistry, isolation, identification and pharmaceutical applications of carbohydrates and derived products, lipids, volatile oils, resins, tannins, glycosides, alkaloids and enzymes; phytochemical screening of crude drugs; extraction, isolation and characterization of phytoconstituents.

General techniques of biosynthetic studies; primary and secondary metabolic pathways; biosynthesis of alkaloids, glycosides, terpenoids and phenolic compounds; plant tissue culture and its applications in production of phytopharmaceuticals; biotechnology in natural product research.

UNIT-V

Traditional systems of medicine; holistic concept of drug administration; Ayurvedic preparations including Arishtas, Asavas, Gutikas, Tailas, Churnas, Lehyas and Bhasmas; herbal formulations; nutraceuticals; herbs as health foods and cosmetics; role of plant-based drugs in healthcare and national economy.

Natural allergens; photosensitizing agents; fungal toxins; medicinally important natural products; standardization, quality assurance and regulatory aspects of herbal medicines.