RAM KRISHNA DHARMARTH FOUNDATION UNIVERSITY, BHOPAL

Ph.D. Entrance Exam

Subject: Pharmaceutical Sciences

Syllabus

Spectroscopic techniques: Introduction, instrumentation, basic principle, interpretation of spectra and applications of UV-visible spectroscopy, Infra-red spectroscopy, NMR spectroscopy and Mass spectrometery in pharmacy.

Chromatographic techniques: Introduction, instrumentation, basic principle and applications of paper chromatography, thin layer chromatography, ion exchange chromatography, column chromatography, affinity chromatography, GC, HPLC and HPTLC in pharmacy.

Thermoanalytical techniques: Differential Scanning Calorimetry, Thermogravimetry, Thermo mechanical analysis: Principles instrumentation and applications.

Radio analytical techniques used in pharmaceuticals: Isotopic dilution methods, Radioimmunoassay, ELISA etc.

Microscopy: Transmission electron microscopy, Scanning electron microscopy, cryomicroscopy, Atomic force microscopy, Confocal microscopy

Preformulation studies: Introduction, goals of preformulation, physicochemical properties, criteria for selection of drug and excipients, compatibility tests.

Pharmaceutics and drug delivery systems: Drug absorption, distribution, biotransformation and excretion, strategies and approaches for designing drug delivery systems, sustained and controlled drug delivery systems.

Quality assurance: Concept of total quality management, requirements of GMP, GLP, GCP, regulatory requirements of drugs and pharmaceuticals.

Pharmacology and Medicinal chemistry: Types of receptors, drug-receptor interaction including signal transduction, mechanism, drug action and adverse drug reactions. General pathways of drug metabolism, basic concepts and application of prodrug design. Mechanism of action, structure activity relationship and pharmacology of: anticancer, anti-epileptic, antiparkinson, sedatives, hypnotics, NSAIDs, ANS and CVS drugs.

Pharmacogostical studies: General methods of extraction, isolation, purification and preliminary phytochemical screening methods. Factors affecting cultivation, collection, processing and storage of crude drugs. Pharmacognostic study of drugs under alkaloids and glycosides. Evaluation of crude drugs.

Organic chemistry: Chemistry of the following name reactions: Birch reduction, Benzil-benzilic acid rearrangement, Friedel-Crafts reaction, Free radical rearrangement, Grignard reaction, Gattermann-Koch reaction, Mannich reaction, Michael reaction, Pinacol-pinacolone rearrangement, Sandmeyer reaction and Vilsmeier reaction.

Basic concepts of stereochemistry.