Dr. Babasaheb Ambedkar Marathwada University Aurangabad
Syllabus for Ph.D. Entrance Test (PET) 2016
Under Faculty of Engineering & Technology
Subject: Pharmacy

Section - A: Research Methodology

Unit-I

Objectives of Research, Research Approaches, Significance of Research, Types of Research, Research Process, Criteria of Good Research, Defining the Research Problem, Selecting the Problem, Technique Involved in Defining a Problem, Methods and Tools in Research, Qualitative and Quantitative Studies, Inquiry Forms, Questionnaire, Developing a Research Plan, Literature review, Use of Library, Books and Journals, Use of Internet (Different useful sites), Patent Search

Unit-II

Data analysis, Types of data, Parametric and Non-parametric Data, Basic Concepts of Probability, Probability Axioms, Analysis and Treatment of Data, Measures of Central Tendency, Measures of Dispersions, Measures of Symmetry, Measures of Peakedness.

Unit-III

Regression Analysis – Simple Linear Regression, Multiple linear Regression, Correlation and Regression Analysis, Tests of Hypothesis and Goodness of Fit: Definition of null and alternative hypothesis, students 't' distribution, Chi-square distribution, F-test

Unit-IV

Interpretation and Report Writing: Meaning of Interpretation, Techniques of Interpretation, Significance of Report Writing, Steps in Writing Report, Layout of the Research Report, Types of Reports, Oral Presentation, Parts of Dissertation/Thesis writing, Different Styles of Dissertation/Thesis writing

Unit-V

Sources of procurement of Research Grants, Development of Research Proposal, Industry Institute Interaction, Writing a technical paper, Plagiarism and its Implications.

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Section - B: Pharmacy

UNIT-I: PHARMACEUTICS

Introduction to Physical pharmacy: Matter, Properties of Matter, Micromeretics and Powder Rheology, Surface and Interfacial Phenomenon, Viscosity and Rheology, Dispersion Systems, Complexation, Kinetics and Drug Stability:

Importance of microbiology in pharmacy: Structure of bacterial cell; Classification of microbes and their taxonomy, Identification of Microbes, Control of microbes by physical and chemical methods, Sterilization, Immunology and Immunological Preparations, Genetic Recombination, Antibiotics

Introduction to pharmaceutical jurisprudence & ethics: Pharmaceutical Legislations, An elaborate study and study of the various Acts with special reference to the main provisions and the latest amendments.

Introduction to dispensing and community pharmacy: Prescription, Principles involved and procedures adopted in dispensing, Incompatibilities, Community Pharmacy, Organization and Structure of hospital pharmacy, Hospital Formulary, Drug Store Management and Inventory Control, Drug distribution Systems in Hospitals, Central Sterile Supply Unit and their Management, Manufacture of Sterile and Non-sterile Products, Drug Information Services, Records and Reports, Pharmacoepidemiology, Nuclear Pharmacy:

Importance of unit operations in manufacturing, Stoichiometry: Unit processes, Fluid Flow, Heat transfer, Evaporation, Distillation, Drying, Size Reduction, Mixing, Filtration and Centrifugation, Crystallization, Dehumidification and Humidity Control, Refrigeration and Air Conditioning, Material of Construction, Material Handling Systems, Corrosion, Plant location, Industrial Hazards and Safety Precautions, Automated Process Control Systems.

Dosages Forms, designing & evaluation: Liquid Dosages Forms, Semisolid Dosage Forms, Suppositories, Extraction and Galenical Products, Blood Products and Plasma Substitutes, Pharmaceutical Aerosols, Ophthalmic Preparations, Cosmeticology and Cosmetic Preparations, Capsules, Micro-encapsulation, Tablets, Coating of Tablets, Parenteral Products, Surgical products, Packaging of Pharmaceutical Products, Designing of dosage forms, Performance evaluation methods.

Biopharmaceutics & Pharmacokinetics: Introduction to biopharmaceutics, Pharmacokinetics, Clinical Pharmacokinetics, Bioavailability and bioequivalence:

UNIT-II: PHARMACEUTICAL CHEMISTRY

Inorganic pharmaceutical & medicinal chemistry: Importance of inorganic compounds in pharmacy and medicine; Gastrointestinal Agents, Major Intra- and Extra-cellular Electrolytes, Essential and Trace Elements, Topical Agents, Gases and Vapors, Dental Products, Miscellaneous Agents, Pharmaceutical Aids Used in Pharmaceutical Industry, Acids, Bases and Buffers, Inorganic Radiopharmaceuticals:

Physical Chemistry and its importance in pharmacy: Importance of basic fundamentals of physical chemistry in pharmacy, The Liquid State, Solutions, Thermodynamics, Thermochemical equations; Phase rule; Adsorption, Photochemistry, Kinetics, Quantum Mechanics

Organic Chemistry and its importance in pharmacy: Importance of fundamentals of organic chemistry in pharmaceutical sciences; Structure and Properties, Stereochemistry, Stereoselective and stereospecific reactions; Nucleophilic and Electrophilic Aromatic Substitution Reactions, Elimination reactions; Conservation of Orbital Symmetry and Rules, Neighboring group effects; Catalysis by transition metal complexes; Heterocyclic Compounds

Biochemistry: Biochemistry in pharmaceutical sciences, Enzymes, Co-enzymes, The Citric Acid Cycle, Lipids Metabolism, Biological Oxidation, Metabolism of ammonia and nitrogen containing monomers, Purine biosynthesis, Biosynthesis of Nucleic Acids, Mutation, Genetic Code and Protein Synthesis

Medicinal Chemistry: Basic Principles, Drug metabolism and Concept of Prodrugs; Principles of Drug Design (Theoretical Aspects), Synthetic Procedures, Mode of Action, Uses, Structure Activity Relationships including Physicochemical Properties of the Classes of Drugs: Autacoids, Steroidal Drugs, Drugs acting on the central nervous system, Diuretics, Cardiovascular drugs, Thyroid and Anti thyroid drugs, Insulin and oral hypoglycemic agents, Microbial Transformations, Enzyme Immobilization:

UNIT-III: PHARMACEUTICAL ANALYSIS

Different techniques of pharmaceutical analysis, Preliminaries and definitions, Fundamentals of volumetric analysis, Acid Base Titrations, Oxidation Reduction Titrations, Precipitation Titrations, Gravimetric Analysis, Non-aqueous titrations, Complexometric titrations, Miscellaneous Methods of Analysis, Extraction procedures including separation of drugs from excipients; Potentiometry, Conductometry, Coulometry, Polarography, Amperometry, Chromatography, The Theoretical Aspects, Basic Instrumentation, Elements of Interpretation of Spectra, and Applications (quantitative and qualitative) of Analytical Techniques, Quality assurance.

UNIT-IV: PHARMACOLOGY

Pathophysiology of common diseases; Basic Principles of Cell Injury and Adaptations, Basic Mechanisms involved in the process of inflammation and repair, Immunopathophysiology, Pathophysiology of Common Diseases, Fundamentals of general pharmacology, Pharmacology of Peripheral Nervous System, Pharmacology of Central Nervous System, Pharmacology of Cardiovascular System, Drugs Acting on the Hemopoietic System, Drugs acting on urinary system, Autacoids, Drugs Acting on the Respiratory System, Drugs acting on the Gastrointestinal Tract, Pharmacology of Endocrine System, Chemotherapy, Principles of Toxicology, Basic Concepts of Pharmacotherapy, Important Disorders of Organs, Systems and their Management, CNS Disorders, Respiratory disease, Gastrointestinal Disorders, Endocrine Disorders, Infectious Diseases, Joint and Connective tissue disorders, Neoplastic Diseases.

UNIT-V: PHARMACOGNOSY

Sources of Drugs, Classification of Drugs, Study of medicinally important plants belonging to the families with special reference to Cultivation, Collection, Processing and Storage of Crude Drugs, Quality Control of Crude Drugs, Introduction to Active Constituents of Drugs.

Systematic Pharmacognostic study of the followings: Carbohydrates and derived products, Lipids, Resins, Tannins, Volatile Oils, Phytochemical Screening, Fibers, Study of the biological sources, cultivation, collection, commercial varieties, chemical constituents, substitutes, adulterants, uses, diagnostic macroscopic and microscopic features and specific chemical tests of following groups of drugs.

Glycoside Containing Drugs: Saponins, Cardioactive glycosides, Anthraquinone cathartics, Others:

Alkaloid Containing Drugs: Pyridine-piperidine, Tropane, Quinoline and Isoquinoline, Indole, Imidazole, Steroidal, Alkaloidal Amine, Glycoalkaloid, Purines.

Studies of Traditional Drugs: General Techniques of Biosynthetic Studies and Basic Metabolic Pathways, Biogenesis, Terpenes, Carotenoids, Glycosides, Alkaloids, Lignans, quassanoids and flavonoids. Role of plant-based drugs on National economy, Plant Tissue Culture, Marine pharmacognosy: