Ph.D by RESEARCH ENTRANCE EXAMINATION - 2019

QUESTION PAPER FORMAT

<table>
<thead>
<tr>
<th>#</th>
<th>TYPE</th>
<th>MAXIMUM MARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>WRITTEN</td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>PART A – Research Methodology</td>
<td>Marks (25 Questions of 2 Marks 50 Each)</td>
</tr>
<tr>
<td>b</td>
<td>PART B – Technical Paper</td>
<td>Marks (25 Questions of 2 Marks 50 Each)</td>
</tr>
<tr>
<td>II</td>
<td>VIVA-VOCE</td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>PART C – Technical Interview</td>
<td>50 Marks</td>
</tr>
</tbody>
</table>

Ph.D
PART A

EPHM001: RESEARCH METHODOLOGY
(COMMON TO ALL PROGRAMS)

I. Research:

II. Hypothesis:
Variables, Development of Working Hypothesis, Deriving Objectives of Research, Sampling, Material and Methods, Data Analysis, Results and Discussion: Discussion, Purpose and Function of Discussion

III. Research Design:
Basic Principles; Features of Good Design, Methods; Developing a Research Plan,
Determining Experimental and Sample Designs, Summary and Conclusions, Abstracts, Key Words; References; Citation Styles

IV. Report And Article Writing:
Structure and Components; Types of Report; Technical Reports and Thesis; Significance; Preparation; Layout, Structure and Language of Typical Reports; Presentation; Effective Communication. Scientific Article Writing: Title Preparation; List of Authors and Addresses, Abstracts; Economy of Words

V. Research Proposal Fundamentals:
Grant Proposal, Proposal Parts; Research Ethics, Relationship in Research Groups; Hazards to Good Scientific Practice; Scientific Misconduct, Intellectual Property Rights, Patents, Copyrights, Trademarks

PART B: TECHNICAL PAPER
Pharmacy Practice (M.Pharm Pharmacy Practice and Pharm.D Graduate)

Unit I to Unit VII
Pharmacotherapeutics.
Etiopathogenesis and pharmacotherapy of diseases associated with following systems/diseases-

UNIT I:
a. Hypertension, Asthma, Diabetes mellitus and Osteoporosis.
b. Prescribing Guidelines for Pediatric, Geriatric and Pregnancy and Breastfeeding, Rational Drug Use.

UNIT II
Tuberculosis, Meningitis, Respiratory tract infections, Urinary tract infections, HIV,

UNIT III
Rheumatoid arthritis, Gout and Osteoarthritis. Acute and Chronic Renal Failure

UNIT IV
Chemotherapy of breast cancer, leukemia and management of chemotherapy induced nausea and emesis.

UNIT V
Peptic ulcer disease, Gastro Esophageal Reflux Disease, Inflammatory bowel disease, Alcoholic liver disease, Viral hepatitis,
UNIT - VI
Anaemias, Venous thromboembolism,
Epilepsy, Parkinsonism, Stroke, Alzheimer's disease.

UNIT - VII
Schizophrenia, bipolar disorder, Anxiety disorders, Obsessive Compulsive disorders, Headache, pain management.

Unit- VIII
Hospital pharmacy services
Procurement & warehousing of drugs and Pharmaceuticals, Inventory control- Definition, various methods of Inventory Control, ABC, VED, EOQ, Lead time, safety stock, Drug distribution in the hospital, Individual prescription method, Floor stock method, Unit dose drug distribution method, Distribution of Narcotic and other controlled substances,

Unit- IX
Essential skills for Clinical Pharmacy Practice
Drug therapy monitoring (medication chart review, clinical review, pharmacist interventions), Clinical laboratory tests used in the evaluation of disease states, and interpretation of test results. Adverse drug reactions, Pharmaceutical care. Patient counseling, Patient medication adherence,

Unit- X
a. Clinical Research
   Drug development process, Clinical development of drug.
b. Pharmacoepidemiology and Pharmacoeconomics
   Measurement of outcomes in Pharmacoepidemiology, Concept of risk in Pharmacoepidemiology, Pharmacoepidemiological methods, Pharmacoeconomics.
c. Clinical Pharmacokinetics and Drug Therapeutic Monitoring
PART B: TECHNICAL PAPER.

Pharmaceutical Sciences (M.Pharm Graduates)

UNIT-I. a) Electro Magnetic Spectrum, Definition, equation and applications of Beer’s law, Hook’s law & Bragg’s Law.

UNIT-II.
Principle and applications of various chromatographic techniques like GC, HPLC, HPTLC, Ion Exchange, Size Exclusion and Electrophoresis.

UNIT-III. Introduction to dosage forms: Classification and definitions. Commonly used vehicles, essential adjuvants like stabilizers, colorants and flavorants with relevance to monophasic liquid dosage forms.
a) Suspensions: Definition, classification, advantages and disadvantages, additives used in suspension, stability of suspension.
b) Emulsions: Definition, classification and identification of types of emulsions, additives used in emulsions, mechanism of action of emulsifying agents, stability of emulsions.

UNIT-IV.
a) Powders and granules: Classification, advantages and disadvantages and methods of mixing of powders.
b) Tablets: Types of Tablets, Excipients used in tablets. Sugar coated tablets, film coated tablets, quality control tests.
c) Capsules: Types of Capsules, raw materials for gelatin capsule shell, storage conditions of capsules.
d) Novel drug delivery systems: advantages and disadvantages, concepts, types of drug delivery systems, Applications of microspheres, liposomes, niosomes, nanoparticles

UNIT-V.
a) Pharmacokinetics- The dynamics of drug absorption, distribution, metabolism and elimination.
b) Pharmacodynamics- Molecular mechanisms of drug action (general). Drug toxicity and poisoning.

UNIT-VI.
Scope and relevance of preclinical and clinical trials. Adverse drug reactions (ADRs). Role of pharmacovigilance ability in ADR monitoring. Receptors- Adrenergic, cholinergic, histaminergic and dopaminergic receptors.

UNIT-VII.
Physicochemical properties in relation to biological action- Ionization, Solubility, Partition Coefficient, Hydrogen bonding, Protein Binding and Bioisosterism.

UNIT-VIII.
• Sulphonamides
UNIT-IX.
a) **Principle and Applications of** different extraction & isolation methods viz., Maceration, Percolation, Sohxlet extraction, microwave extraction, supercritical fluid extraction.
b) **Adulteration and evaluation of crude drugs:** Different methods of adulteration: Evaluation of drugs by organoleptic, microscopic, physical, chemical and biological methods.
c) **Phytoconstituents:** - **Definition, classification, and pharmaceutical importance of:** alkaloids, glycosides, steroids.
d) **Quality control and Standardization of herbal drugs:** Significance and determination of Extractive values, Ash values, Heavy metals, Pesticidal residue and microbial load in herbal preparations

UNIT-X.
a) **Plant tissue culture:** - Growth media, Plant growth regulators, Callus & Suspension cultures, immobilization, hairy root culture. Transgenic plants and their applications, Plant tissue culture as source of secondary metabolites.
b) **Enzymes:** - Biological sources and uses of: Papain, Bromelain, Urokinase, and streptokinase.

**Reference Books:**

UNIT- I & II.


UNIT-III & IV.