



## Ph.D by RESEARCH ENTRANCE EXAMINATION - 2019

### QUESTION PAPER FORMAT

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

### Ph.D

### PART A

### EPHM001: RESEARCH METHODOLOGY

### (COMMON TO ALL PROGRAMS)

#### I. Research:

Meaning, Objectives and Characteristics of Research, Types of Research , Research Process, Problem Statement, Literature Survey, Importance, Sources, Identifying Gap Areas, Development Of Working Hypothesis.

#### 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, Abstract-  
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**

Design of dosage regimens, Pharmacokinetics of Drug Interaction, Therapeutic Drug  
monitoring, Dosage adjustment in Renal and hepatic Disease. Population  
Pharmacokinetics. Pharmacogenetics.

## 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.

b) Principles of various spectroscopic analytical techniques like UV-Visible I.R, Fluorimetry, Nephelo- Turbidimetry, NMR and Mass Spectroscopy.

#### **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

- • Antitubercular agents
- • Antimalarial agents
- • Classification of antibiotics .
- • Concept of Prodrug

#### **UNIT-IX.**

**a) Principle and Applications of** different extraction & isolation methods viz ., Maceration, Percolation, Soxhlet 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.**

1. Instrumental Methods of Analysis Paperback – December 1, 2004 , Willard, Merritt , & Dean. 7th edition.

2. Principles of Instrumental Analysis , Douglas A. Skoog , F. James Holler , Stanley R. Crouch. 6th Edition

3. Morrison and Boyd Organic Chemistry ,8th edition.

4. *Organic chemistry*. Volume 2: Stereochemistry and the chemistry of natural products, *Finar, I. L.* 8th edition

#### **UNIT-III & IV.**

5. Ansel's Pharmaceutical Dosage Form and Drug Delivery Systems, Loyd V. Allen, Jr. Nicholas G. Popovich, Howard C. Ansel, Lippincott Williams and Walkins, New Delhi. 9th edition

6. Pharmaceutics, The Science & Dosage Form Design M.E. Aulton Churchill Livingstone, Edinburgh  
Pharmaceutics : the science of dosage form design, 2nd ed, 2002.