

# **Swami Rama Himalayan University**

## **Ph.D. Syllabus for Entrance Examination**

### **(Pharmacology)**

#### **Unit I**

##### **Basic & Systemic Pharmacology**

###### **General Pharmacology:**

- Pharmacology –history and development
- Pharmacokinetics
- Pharmacodynamics
- Adverse drug reactions
- Drug interactions and iatrogenic disorders
- Pharmacogenetics & genomics

###### **Autonomic nervous system:**

- Anatomical and physiological considerations of the autonomic nervous system
- Cholinergic system- Cholinergic agonists, anticholinesterases and antimuscarinic drugs
- Adrenergic system- Adrenergic drugs, Alpha adrenergic blocking agents, Beta adrenergic blocking agents

###### **Autacoids & related drugs**

- Prostaglandins & prostaglandin analogues
- Histamine & antihistaminics
- Pharmacology of serotonin & drug therapy of migraine
- NSAIDs & drug therapy of Rheumatoid arthritis & gout

###### **Central Nervous system:**

- Physiology and pharmacology of neurohumoral transmission in the central nervous system
- Anaesthetic agents used in general anaesthesia
- Central & peripheral analgesics- Opioids & NSAIDs
- Psychopharmacology- Antipsychotics, Antidepressant drugs & Antianxiety drugs
- Sedative-hypnotics & antiepileptics

## **UNIT II**

### **Systemic Pharmacology**

#### **Cardiovascular system**

- Basic physiology of cardiovascular system including electrophysiology of the heart, mechanics of myocardial contraction and RAAS system
- Anti hypertensive agents
- Antiarrhythmic drugs
- Drugs for CHF
- Angina pectoris & MI
- Hypolipidemic drugs
- Drugs acting on coagulation system
- Antiplatelet drugs

#### **Endocrinology:**

- Physiological considerations of endocrine system in relation to pharmacological actions of drugs & drug targets
- Antidiabetic drugs
- Thyroid and anti thyroid drugs
- Corticosteroids
- Sex Steroids & related drugs
- Drugs affecting calcium homeostasis

#### **Chemotherapy**

- Introduction to mechanism of action and principles of anti microbial therapy
- Antimicrobial agents
  - Antibacterial agents
  - Antifungal agents
  - Antiviral agents
  - Antimalarial agents
  - Antiamoebic agents
- Antineoplastic agents & immunomodulators

#### **Respiratory Pharmacology**

- Respiratory physiology in relation to pharmacological actions of drugs & drug targets
- Drugs used in Bronchial Asthma
- Drugs used in the treatment of cough

#### **GIT Pharmacology**

- Physiology of GI system in relation to pharmacological actions of drugs & drug targets
- Antiulcer drugs
- Antiemetics

- Drugs used in diarrhea & constipation

### **Unit III**

#### **Clinical & Applied Pharmacology**

- Clinical pharmacokinetics, concentration effect relationship, pharmacokinetic parameters, target concentration strategies, plateau principle and population pharmacokinetics
- Bioavailability & Bioequivalence studies
- Therapeutic drug monitoring
- ADR monitoring and prevention
- Bioavailability and bioequivalence studies
- Pharmacoeconomics and pharmacoepidemiology
- Principles of rational drug therapy with emphasis on antimicrobial chemotherapy
- Concept of essential drugs
- Drug therapy in extremes of age ( Neonatal/Geriatric)
- Drug therapy in pregnancy and lactation
- P drug & P-medicine
- Prescription auditing and critical evaluation of research papers, promotional materials / drug advertising materials etc.
- Evidence based medicine
- Recent advances

### **Unit IV**

#### **Research Methods in Pharmacology**

- Keeping and breeding of laboratory animals
- Drug regulations
- Bioassay and its importance
- Drug development ( Pre clinical and clinical)
- Drug discovery & evaluation through pharmacological assays
- Screening methods in pharmacology for evaluation of drug activities
- Acute/ subacute and chronic toxicity studies on animals
- Clinical trials
  - Design, implementation and evaluation
  - Phase 0, I, II, III, IV
  - Ethical and legal aspects in clinical trials and drug therapy
- Basic Biostatistics
- Research protocol and thesis writing, offline and online literature search and basics of MS-PowerPoint

## UNIT V

### Recent advances in Pharmacology

- Recent advances in ANS Pharmacology
- Recent advances in CNS Pharmacology
- Recent advances in CVS Pharmacology
- Recent advances in Endocrine Pharmacology
- Recent advances in antimicrobial and antineoplastic Pharmacology
- Recent advances in Respiratory Pharmacology
- Recent advances in GIT Pharmacology
- Recent advances in drug discovery & development

### REFERENCES

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4. Rang HP, Ritter JM, Flower RJ, Dale MM, Moore PK. Rang & Dale's Pharmacology: Elsevier health sciences, 8<sup>th</sup> edition.2016
5. Sharma HL, Sharma KK. Principles of Pharmacology: Jaypee publishers. 3rd ed./2017
6. Vogel HG, Maas J, Gebauer A, Drug Discovery and Evaluation: Methods in Clinical Pharmacology, Springer; 2<sup>nd</sup>/2011 edition
7. Rowland M, Tozer TN, Clinical Pharmacokinetics Concept and Applications; Bi Waverly Pvt. Ltd. 4<sup>th</sup> edition/2007
8. Friedman LM, Furberg CD, DeMets D. Fundamentals of Clinical Trials 4th ed. 2010.