

**RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER**  
**SYLLABUS FOR SCREENING TEST FOR THE POST OF**  
**ASSISTANT PROFESSOR (Broad Speciality) PHARMACOLOGY**  
**MEDICAL EDUCATION DEPARTMENT**

**Unit –I - Basic and clinical Pharmacology**

- Pharmacology- History & Development.
- Structure activities, relationships & its significance.
- Chemical nomenclature as used in PHARMACOLOGY.
- Passage of drug across biological membranes.
- Absorption and Distribution of drugs: Binding of drugs to Plasma proteins.
- Biotransformation, Excretion of Drugs & Factors affecting these.
- Mechanism of action.
- Drug-Drug interactions & Iatrogenic Disorder.
- Pharmacogenetics.
- Drug addiction and its management.
- Teratogenicity and Carcinogenicity including methods for their study.
- Drug Resistance.

**Unit –II - Autonomic Nervous System**

- Anatomical and Physiological consideration of A.N.S.
- Cholinergic Agonists and Anti-cholinergic Drugs.
- Neuromuscular blocking agents, Screening of Neuromuscular blocking and Ganglionic blocking agents.
- Anticholinesterases agent and Anticholinesterases Reactivators.
- Receptor mechanism, Adrenergic receptor and their Pharmacological characterization.
- Catecholamine biosynthesis, release and factors affecting these.
- Catecholamine, their Pharmacology and Therapeutics.
- Non Catecholamine Sympathomimetic agents.
- Alfa & Betaadrenergic blocking agents.

**Unit – III – CNS & Peripheral Nervous System**

- Physiology and Pharmacology of neurohormonal transmission in CNS.
- Pathophysiology and Management of Parkinsonism and other neurodegenerative disorders.
- Preanaesthetic medication and stages of anaesthesia.
- General Anaesthetic agents.
- Local anaesthetic and their screening.
- Opioid receptors Enkephalins and Endorphins.
- Opioid Analgesics and their antagonists.
- Analgesics, Anti pyretics and anti-inflammatory agents.
- Antidepressants drugs.
- Antipsychotics drugs and Lithium.
- Sedative & Hypnotics.
- Anti-anxiety drugs.
- Centrally acting muscle relaxants and their screening methods.
- Alcohols.
- CNS Stimulants and cognition enhancers.
- Drug Abuse.
- Antiepileptic drugs.

#### **Unit –IV - Cardiovascular System**

- Pathophysiology and treatment of Cardiac Arrhythmias.
- Pathophysiology and treatment of Cardiac failure.
- Pathophysiology and treatment of Ischamic Heart Diseases.
- Antihypertensive drugs and treatment of HT.
- Drugs for peripheral vascular disease.

#### **Unit – V - Antimicrobial Agents**

- Introduction mechanism of action and principles of Antimicrobials therapy
- Sulphonamides
- Beta-lactams antibiotics
- Tetracyclines and Chloramphenicol
- Aminoglycosides
- Macrolides
- Quinolones and treatment of Urinary tract Infections.
- Antiamoebic Drugs.
- Antimalarial agents
- Anti-Tubercular Drugs
- AntiLeprotic Drugs
- Antifungal agents
- Antiviral agents
- Anthelmintics
- Antineoplastic Agents
- Miscellaneous antimicrobials.

#### **Unit -VI - Endocrinology**

- Androgens and anabolic steroids.
- Adrenal steroids, Sex hormones & Anti-fertility agents.
- Hypothalamic and pituitary hormones.
- Pancreatic hormones.
- Anti-diabetic agents.
- Thyroid and Anti-thyroid drugs.
- Calcium Metabolism & Drugs affecting bone mineralization.
- Drugs acting on the Uterus.

#### **Unit – VII - Renal System**

- Diuretics and Antidiuretics.

#### **Unit – VIII - Autacoids**

- Histamine and Anti-Histaminics.
- 5-HT, its Agonists and Antagonists. Treatment of Migraine.
- Prostaglandins, Leukotrienes and Platelets Activating Factors.
- Ergot alkaloids.

#### **Unit – IX - Respiratory System**

- Treatment of Cough, Bronchial Asthma and COPD.

#### **Unit – X - Gastrointestinal System**

- Treatment of acid peptic diseases.
- Emetics and Antiemetics.
- Drugs for constipation, Diarrohea and Inflammatory Bowel Diseases.

### **Unit – XI -Blood**

- Haematinics, Erythropoietin.
- Coagulants and anti-coagulants, Antiplatelets & Thrombolytics.
- Hypolipidemic drugs.
- Plasma expanders and Pharmacotherapy of shock.

### **Unit – XII - Miscellaneous Topics**

- Antineoplastic agents.
- Immunotherapy.
- Gene Therapy.
- Chelating Agents.
- Vitamins, Vaccines, Sera, Immunoglobulin.
- Dermatological Pharmacology.
- Antiseptics and Disinfectants.

### **Unit – XIII - Applied Pharmacology**

- Vasoactive peptides.
- Pharmacoeconomics.
- Pharmacogenetics.
- Pharmacoepidemiology.
- Drugs in sports and Doping test.
- Pharmacogenomics.
- Microdosing.
- Alternatives to Animal experiments.
- Role of biotechnology in recent drug development.
- Role of free radical in health and disease.
- Newer drug delivery system.
- Noble laureates in Pharmacology.
- Pharmacovigilance

### **Unit – XIV – Biochemical Pharmacology**

- Analytical methods in Pharmacology and Toxicology.
- Principles involved in identification and quantification of substances by -Chromatography – Spectrophotometry - Flame photometry - Spectro fluoro photometry -HPLC and Gas chromatography - Mass Spectrometry.
- Principles of immunological assays including Radioimmunoassay and their importance.
- Tracer techniques using radioactive substances and measurements.

### **Unit – XV – Clinical Pharmacology**

- General principles of clinical Pharmacology i.e. dynamics, kinetics, ADR, and factors modifying drug effects.
- Clinical pharmacokinetics concentration effect relationship&parameter , Target concentration strategies, Plateau principles, population pharmacokinetics.
- Therapeutic drug monitoring.
- A.D.R. monitoring and prevention.
- Bioavailability and bioequivalence studies.
- Placebo.
- Designs and implementation of clinical trials.
- Clinical drug developmental studies(Phase 1,2,3,4).
- Drug therapy in extremes of age (Neonate, Elder,Old).
- Drug therapy in pregnancy and lactation.
- Iatrogenic disorder.

- Prescription auditing and critical evaluation of research papers, promotional material etc.
- Ethical and legal aspect in clinical trials and drug therapy.

### **Unit –XVI - Research Methodology**

- Keeping and breeding laboratory animals.
- Regulatory guidelines (CPCSEA) and alternatives to animal experiments.
- Drug development (preclinical and clinical).
- Drug regulations. Preclinical in ‘vitro and in vivo.
- Bioassay and its importance.
- Screening methods in Pharmacology for evaluation of drug activities on
  - A- A.N.S.
  - B- C.N.S (sedatives, hypnotics, psychotropics, anxiolytics, antidepressant, anti-convulsants, local anaesthetics, anti parkinsonian drugs, NSAIDS, OPIOIDS).
  - C- Respiratory system drugs.
  - D- C,V,S(Anti-anginal, anti-hypertensive, anti-arrhythmic, drugs used in CHF ).
  - E- Diuretic screening.
  - F- G.I.T Drugs(Peptic ulcer, emetics and anti-emetics, anti- diarrhoeal agents).
  - G- Oxytocin and tocolytics.
  - H- Hormones(Oral hypoglycemics, screening of fertility and anti-fertility agents).
- Toxicities studies- Acute/sub/chronic toxicity studies in animals.
- Protocol designing and writing of thesis.
- Writing of papers, reports, review of scientific journals.

### **Unit - XVII – Biostatistics**

- Normal distribution, random numbers.
- Mean mode, median, standard Deviation, Standard Error.
- Z Test and P Values.
- Student t test (paired and unpaired), chi-square test.
- Non parameter test for one, two and K sample problems.
- ANOVA.
- Correlation, simple linear regression and multiple linear regression.
- Epidemiological statistics.

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#### **Pattern of Question Papers:**

- 1. Objective Type Paper**
- 2. Maximum Marks: 180**
- 3. Number of Questions: 180**
- 4. Duration of Paper : Three Hours**
- 5. All Questions carry equal marks**
- 6. Medium of Screening Test: English**
- 7. There will be Negative Marking**  
(1/3 part of the mark(s) of each question will be deducted for each wrong answer)