



SYLLABUS FOR SCREENING TEST FOR THE POST OF ASSISTANT PROFESSOR

Subject : PHARMACEUTICAL SCIENCES

Note: There shall be 100 questions with multiple Choices carrying 100 marks to be completed in 3 hrs duration.

UNIT – 1 : Pharmaceutics :

General formulation, evaluation and packaging of different dosage forms including tablets, capsules, suspensions, emulsions, parenterals, aerosols, suppositories etc. Blood products and their standardization. Formulation and packaging of cosmetics for skin, hair, teeth and nails. Sustained release dosage forms and Novel drug delivery systems. Preformulation. Biopharmaceutics and pharmacokinetics including compartment and clinical pharmacokinetics. Properties of matter, micromeritics, viscosity, rheology and drug stability kinetics. Incompatibility including physical chemical and therapeutic incompatibility. Dispensing of different dosage forms. Organization and structure of hospital pharmacy, drug distribution system, drug information service, purchase and inventory control, records and reports. Methods of handling radioisotopes including their preparation. Fluid flow, heat transfer, drying, mixing, size reduction, filtration, crystallization, industrial hazards and safety precautions. Automated process control systems. Elaborate study of pharmacy act 1948, drug and cosmetic act 1940 and rules 1945, narcotic and psychotropic substance act 1985, drug price control, drug and magic remedies act 1954, AICTE act 1987, factory act 1948, minimum wages act 1948 and patent act 1970. Immunity & immunological preparation including methods of preparation storage and standardization of vaccines and sera. Sterilization and sterility testing. Microbial assay of vitamins, antibiotics and amino acids. Genetic recombinant technology.

UNIT – 2 : Pharmaceutical chemistry :

Limit test for iron, arsenic, heavy metals, lead, chloride and sulphate. Acid basis and buffers including buffer equation and adjustment of tonicity. Sources of impurities. Nomenclature, isomerism, stereoisomerism, conformational and configurational isomerism, optical activity, specification of configuration, Reactions involving stereoisomers, chirality, conformations; Stereoselective and stereospecific reactions; Structure, Nomenclature, Preparation and Reactions of : Alkanes, Alkenes, Alkynes, Cyclic analogs, Dienes, Benzene, Polynuclear aromatic compounds, Arenes, Alkyl halides, Alcohols, Ethers, Epoxides, Amines, Phenols, Aldehydes and ketones, Carboxylic acids, Functional derivatives of carboxylic acids, α,β -Unsaturated carbonyl compounds, Reactive intermediates-carbocations, carbanions, carbenes and nitrenes; Nucleophilic and Electrophilic Aromatic Substitution Reactions: Reactivity and

orientation; Electrophilic and Nucleophilic Addition Reactions; Rearrangements (Beckman, Hoffman, Benzilic acid, pinacole-pinacolone and Beyer-villiger); Elimination reactions; Conservation of Orbital Symmetry and Rules: Electrocyclic, Cycloaddition and Sigmatropic reactions; Neighboring group effects; Catalysis by transition metal complexes; Heterocyclic Compounds : Nomenclature, preparation, properties and reactions of 3, 4, 5, 6 & 7-membered heterocycles with one or two heteroatoms like O, N, S. Chemistry of lipids, Carbohydrates and Proteins. Enzymes, carbohydrate, proteins and lipid metabolism. Structure, nomenclature, classification, synthesis, SAR and metabolism of the following category of drugs, which are official in Indian Pharmacopoeia and British Pharmacopoeia. Introduction to drug design. Stereochemistry of drug molecules. Hypnotics and Sedatives, Analgesics, NSAIDS, Neuroleptics, Antidepressants, Anxiolytics, Anticonvulsants, Antihistaminics, Local Anaesthetics, Cardio Vascular drugs – Antianginal agents Vasodilators, Adrenergic & Cholinergic drugs, Cardiotonic agents, Diuretics, Anti-hypertensive drugs, Hypoglycemic agents, Antilipidemic agents, Coagulants, Anticoagulants, Antiplatelet agents. Chemotherapeutic agents – Antibiotics, Antibacterials, Sulphadiazines. Antiprotozoal drugs, Antiviral, Anti-tubercular, Antimalarial, Anticancer, Anti-moebic drugs. Diagnostic agents. Preparation, storage and uses of official Radiopharmaceuticals, Vitamins and Hormones. Eicosanoids and their application. Principles, instrumentation and applications of the following : Absorption spectroscopy (UV, visible & IR). Fluorimetry, Flame photometry, Potentiometry. Conductometry and Polarography. Pharmacopoeial assays. Principles of NMR, ESR, Mass spectroscopy. X-ray diffraction analysis and different chromatographic methods.

UNIT – 3 : Pharmacology :

General pharmacological principles including Toxicology. Drug interaction, Pharmacology of drugs acting on Central nervous system, Cardiovascular system, Autonomic nervous system, Gastro intestinal system and Respiratory system. Pharmacology of Autocoids, Hormones, Hormone antagonists, chemotherapeutic agents including anticancer drugs. Bioassays, Immuno Pharmacology. Drugs acting on the blood & blood forming organs. Drugs acting on the renal system. Pathophysiology of Common Diseases: Asthma, diabetes, rheumatoid arthritis, gout, ulcerative colitis, neoplasia, psychosis, depression, mania, epilepsy, acute and chronic renal failure, hypertension, angina, congestive heart failure, atherosclerosis, myocardial infarction, congestive heart failure, peptic ulcer, anemias, hepatic disorders, tuberculosis, urinary tract infections and sexually transmitted diseases.

UNIT – 4 : Pharmacognosy :

The chemistry, tests, isolation, characterization and estimation of phytopharmaceuticals belonging to the group of Alkaloids, Glycosides, Terpenoids, Steroids, Bioflavonoids, Purines, Guggul lipids. Pharmacognosy of crude drugs that contain the above constituents. Standardization of raw materials and herbal products. WHO guidelines. Quantitative microscopy including modern techniques used for evaluation. Biotechnological principles and techniques for plant development , Tissue culture.