

SCHEME AND SYLLABUS OF EXAMINATION

I. The mode of examination and setting-up of question-papers shall be both, i.e., conventional type and objectives type MCQs in Paper I and Paper II. The candidates are required to answer the objective type MCQs in the OMR Sheets and are required to follow the guidelines provided in the OMR Sheet while answering the questions.

II. The subject wise allotment of maximum marks shall be as under :-

Syllabus	Paper	Marks	Time
General Knowledge	Paper I	25 marks	01 : 00 Hour
General English		25 marks	
Main Paper	Paper II	150 marks	01 : 30 Hours
Grand Total		200 marks	02 : 30 Hours

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CONDITIONS OF ELIGIBILITY FOR APPEARING IN THE EXAMINATION

In order to be eligible to appear in the Competitive Examination, a candidate must satisfy the following conditions, namely :-

I. Minimum qualifications :-

For Laboratory Assistant :-
Diploma in Pharmacy from a Pharmacy Council of India recognized College/ Institution.
For Storekeeper :-
Diploma in Pharmacy from a Pharmacy Council of India recognized College/ Institution.

II. Age Limit :-

The age limit for direct recruitment shall be between 18 (eighteen) to 40 (forty) years as on 30 th September, 2023
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III. Required documents :-

i)	Certificate of Identification
ii)	Community Certificate
iii)	Valid Employment Card
iv)	Class X & Class XII passed Mark-sheet & Certificate
v)	Valid Diploma/ Degree from a recognized College/ Institution
vi)	Valid Registration Certificate
vii)	Date of birth proof
viii)	No Objection Certificate from the concerned Head of Department/ Head of Office for in-service candidate
ix)	Marital Status (for female candidate). In case of married women candidate, Certificate of Identification of husband should also be enclosed

IV. Other conditions for appointments :-

i)	The candidates should be conversant in either one of the languages notified by the Government as State Language
ii)	Should have enough knowledge about the history and affairs of the State
iii)	The Selection shall be made through open competitive examinations from amongst the eligible candidates

V. The examinations shall consist of the following :-

i)	Written Examination : 200 marks
ii)	Time Allowed : 02 : 30 Hours

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SYLLABUS FOR WRITTEN EXAMINATION (MAIN PAPER/ MAIN SUBJECT)**PHARMACEUTICS**

History of the profession of Pharmacy in India in relation to Pharmacy education, industry, pharmacy practice, and various professional associations, Pharmacy as a career

Pharmacopoeia : Introduction to IP, BP, USP, NF and Extra Pharmacopoeia. Salient features of Indian Pharmacopoeia

Packaging materials : Types, selection criteria, advantages and disadvantages of glass, plastic, metal, rubber as packaging materials

Pharmaceutical aids : Organoleptic (Colouring, flavouring, and sweetening) agents

Preservatives : Definition, types with examples and uses

Unit operations : Definition, objectives/ applications, principles, construction, and workings

Size reduction : hammer mill and ball mill

Size separation : Classification of powders according to IP, Cyclone separator, Sieves and standards of sieves

Mixing : Double cone blender, Turbine mixer, Triple roller mill and Silver son mixer homogenizer

Filtration : Theory of filtration, membrane filter and sintered glass filter

Drying : working of fluidized bed dryer and process of freeze drying

Extraction : Definition, Classification, method, and applications

Tablets- coated and uncoated, various modified tablets (sustained release, extended-release, fast dissolving, multilayered, etc.)

Capsules- hard and soft gelatin capsules

Liquid oral preparations- solution, syrup, elixir, emulsion, suspension, dry powder for reconstitution

Topical preparations- ointments, creams, pastes, gels, liniments and lotions, suppositories, and peccaries

Nasal preparations- Ear preparations

Powders and granules- Insufflations, dusting powders, effervescent powders, and effervescent granules

Sterile formulations- Injectables, eye drops and eye ointments

Immunological products : Sera, vaccines, toxoids, and their manufacturing methods. Basic structure, layout, sections, and activities of pharmaceutical manufacturing plants

Quality control and quality assurance : Definition and concepts of quality control and quality assurance, current good manufacturing practice (cGMP), Introduction to the concept of calibration and validation.

Novel drug delivery systems : Introduction, Classification with examples, advantages, and challenges

PHARMACEUTICAL CHEMISTRY

Introduction to Pharmaceutical chemistry : Scope and objectives

Sources and types of errors : Accuracy, precision, significant figures

Impurities in Pharmaceuticals : Source and effect of impurities in Pharmacopoeia substances, importance of limit test, Principle and procedures of Limit tests for chlorides, sulphates, iron, heavy metals and arsenic

Volumetric analysis : Fundamentals of volumetric analysis, Acid-base titration, non-aqueous titration, precipitation titration, complex metric titration, redo titration

Gravimetric analysis : Principle and method

Inorganic Pharmaceuticals : Pharmaceutical formulations, market preparations, storage conditions and uses

Haematinics : Ferrous sulphate, Ferrous fumarate, Ferric ammonium citrate, Ferrous ascorbate, Carbonyl iron

Gastro-intestinal Agents : Antacids : Aluminum hydroxide gel, Magnesium hydroxide, Magaldrate, Sodium bicarbonate, Calcium Carbonate, Acidifying agents, Adsorbents, Protectives, Cathartics.

Topical agents : Silver Nitrate, Ionic Silver, Chlorhexidine Gluconate, Hydrogen peroxide, Boric acid, Bleaching powder, Potassium permanganate

Medicinal gases : Carbon dioxide, nitrous oxide, oxygen Introduction to nomenclature of organic chemical systems with particular reference to heterocyclic compounds containing up to Three rings

Drugs Acting on Central Nervous System

Anesthetics : Thiopental Sodium, Ketamine Hydrochloride, Propofol

Sedatives and Hypnotics : Diazepam, Alprazolam, Nitrazepam, Phenobarbital

Antipsychotics : Chlorpromazine Hydrochloride, Haloperidol, Risperidone, Sulpiride, Olanzapine, Quetiapine, Lurasidone

Anticonvulsants : Phenytoin, Carbamazepine, Clonazepam, Valproic Acid, Gabapentin, Topiramate, Vigabatrin, Lamotrigine

Anti-Depressants : Amitriptyline Hydrochloride, Imipramine Hydrochloride, Fluoxetine, Venlafaxine, Duloxetine, Sertraline, Citalopram, Escitalopram, Fluvoxamine, Paroxetine

Drugs Acting on Autonomic Nervous System

Sympathomimetic Agents : Direct Acting : Nor-Epinephrine, Epinephrine, Phenylephrine, Dopamine, Terbutaline, Salbutamol (Albuterol), Naphazoline, Tetrahydrozoline

Indirect Acting Agents : Hydroxy Amphetamine, Pseudoephedrine

Agents With Mixed Mechanism : Ephedrine, Metaraminol

Adrenergic Antagonists : Alpha Adrenergic Blockers : Tolazoline, Phentolamine, Phenoxybenzamine, Prazosin. Beta Adrenergic Blockers : Propranolol, Atenolol, Carvedilol

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Cholinergic Drugs and Related Agents : Direct Acting Agents : Acetylcholine, Carbachol and Pilocarpine. Cholinesterase Inhibitors : Neostigmine, Edrophonium Chloride, Tacrine Hydrochloride, Pralidoxime Chloride, Echothiopate Iodide

Cholinergic Blocking Agents : Atropine Sulphate, Ipratropium Bromide

Synthetic Cholinergic Blocking Agents : Tropicamide, Cyclopentolate Hydrochloride, Clidinium Bromide, Dicyclomine Hydrochloride

Drugs Acting on Cardiovascular System : Anti-Arrhythmic Drugs : Quinidine Sulphate, Procainamide Hydrochloride, Verapamil, Phenytoin Sodium, Lidocaine Hydrochloride, Lorcanide Hydrochloride, Amiodarone and Sotalol

Anti-Hypertensive Agents : Propranolol, Captopril, Ramipril, Methyldopate Hydrochloride, Clonidine Hydrochloride, Hydralazine Hydrochloride, Nifedipine

Antianginal Agents : Isosorbide Dinitrate

Diuretics : Acetazolamide, Frusemide, Bumetanide, Chlorthalidone, Benzthiazide, Metolazone, Xipamide, Spironolactone

Hypoglycemic Agents : Insulin and Its Preparations, Metformin, Glibenclamide, Glimepiride, Pioglitazone, Repaglinide, Gliflozins, Gliptins

Analgesic And Anti-Inflammatory Agents : Morphine Analogues, Narcotic Antagonists

Nonsteroidal Anti-Inflammatory Agents (NSAIDs) - Aspirin, Diclofenac, Ibuprofen, Piroxicam, Celecoxib, Mefenamic Acid, Paracetamol, Aceclofenac

Antifungal Agents : Amphotericin-B, Griseofulvin, Miconazole, Ketoconazole, Itraconazole, Fluconazole, Naftifine Hydrochloride

Urinary Tract Anti-Infective Agents : Norfloxacin, Ciprofloxacin, Ofloxacin, Moxifloxacin

Anti-Tubercular Agents : INH, Ethambutol, Para Amino Salicylic Acid, Pyrazinamide, Rifampicin, Bedaquiline, Delamanid, Pretomanid

Antiviral Agents : Amantadine Hydrochloride, Idoxuridine, Acyclovir, Foscarnet, Zidovudine, Ribavirin, Remdesivir, Favipiravir

Antimalarials : Quinine Sulphate, Chloroquine Phosphate, Primaquine Phosphate, Mefloquine, Cycloguanil, Pyrimethamine, Artemisinin

Sulfonamides : Sulfanilamide, Sulfadiazine, Sulfamethoxazole, Sulfacetamide, Mafenide Acetate, Cotrimoxazole, Dapsone

Antibiotics : Penicillin G, Amoxicillin, Cloxacillin, Streptomycin, Tetracyclines : Doxycycline, Minocycline

Macrolides : Erythromycin, Azithromycin, Miscellaneous : Chloramphenicol Clindamycin

Anti-Neoplastic Agents : Cyclophosphamide, Busulfan, Mercaptopurine, Fluorouracil, Methotrexate, Dactinomycin, Doxorubicin Hydrochloride, Vinblastine Sulphate, Cisplatin, Dromostanolone Propionate

PHARMACOGNOSY

Definition, history, presents status and scope of Pharmacognosy

Classification of drugs : Alphabetical, Taxonomical, Morphological, Pharmacological, Chemical, Chemo-taxonomical

Quality control of crude drugs : Different methods of adulteration of crude drugs, Evaluation of crude drugs

Brief outline of occurrence, distribution, isolation, identification tests, therapeutic activity and pharmaceutical applications of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins
Biological source, chemical constituents and therapeutic efficacy of the following categories of crude drugs :-

Laxatives Aloe : Castor oil, Ispaghula, Senna

Cardiotonic : Digitalis, Arjuna

Carminatives and G.I. regulators : Coriander, Fennel, Cardamom, Ginger, Clove, Black Pepper, Asafoetida, Nutmeg, Cinnamon

Astringents : Myrobalan, Black Catechu, Pale Catechu

Drugs acting on nervous system : Hyoscyamus, Belladonna, Ephedra, Opium, Tea leaves, Coffee seeds, Coca

Anti-hypertensive Rauwolfia

Anti-Tussive Vasaka, Tolu Balsam

Anti-Rheumatics Colchicum seed

Anti-Tumour Vinca, Podophyllum

Antidiabetics Pterocarpus, Gymnema

Diuretics Gokhru, Punarnava

Anti-Dysenteric Ipecacuanha

Antiseptics and disinfectants Benzoin, Myrrh, Neem, Turmeric

Antimalarials Cinchona, Artemisia Oxytocic Ergot

Vitamins Cod liver oil, Shark liver oil

Enzymes Papaya, Diastase, Pancreatin, Yeast

Pharmaceutical Aids Kaolin, Lanolin, Beeswax, Acacia, Tragacanth, Sodium alginate, Agar, Guar gum, Gelatine

Miscellaneous Squill, Galls, Ashwagandha, Tulsi, Guggul

Plant fibres used as surgical dressings : Cotton, silk, wool and regenerated fibres

Basic principles involved in the traditional systems of medicine like : Ayurveda, Siddha, Unani and Homeopathy

Method of preparation of Ayurvedic formulations like : Arista, Asava, Gutika, Taila, Churna, Lehya and Bhasma Role of medicinal and aromatic plants in national economy and their export potential

Herbs as health food : Brief introduction and therapeutic applications of : Nutraceuticals, Antioxidants, Pro-biotics, Pre-biotics, Dietary fibres, Omega-3-fattyacids, Spirulina, Carotenoids, Soya and Garlic

Introduction to herbal formulations

Herbal cosmetics : Sources, chemical constituents, commercial preparations, therapeutic and cosmetic uses of Aloe vera gel, Almond oil, Lavender oil, Olive oil, Rosemary oil, Sandal Wood oil
Phytochemical investigation of drugs

HUMAN ANATOMY AND PHYSIOLOGY

Scope of Anatomy and Physiology Definition of various terminologies

Structure of Cell : Components and its functions

Tissues of the human body : Epithelial, Connective, Muscular and Nervous tissues – their sub-types and characteristics

Osseous system : structure and functions of bones of axial and appendicular skeleton, Classification, types and movements of joints, disorders of joints

Haemopoietic system : Composition and functions of blood, Process of Hemopoiesis, Characteristics and functions of RBCs, WBCs, and Platelets, Mechanism of Blood Clotting, Importance of Blood groups

Lymphatic system : Lymph and lymphatic system, composition, functions and its formation. Structure and functions of spleen and lymph node

Cardiovascular system : Anatomy and Physiology of heart, Blood vessels and circulation (Pulmonary, coronary and systemic circulation), Cardiac cycle and Heart sounds, Basics of ECG, Blood pressure and its regulation

Respiratory system : Anatomy of respiratory organs and their functions. Regulation, and Mechanism of respiration. Respiratory volumes and capacities – definitions

Digestive system : Anatomy and Physiology of the GIT, Anatomy and functions of accessory glands, Physiology of digestion and absorption

Skeletal muscles : Histology, Physiology of muscle contraction, Disorder of skeletal muscles

Nervous system : Classification of nervous system, Anatomy and physiology of cerebrum, cerebellum, midbrain, Function of hypothalamus, medulla oblongata and basalganglia, Spinal cord-structure and reflexes, Names and functions of cranial nerves, Anatomy and physiology of sympathetic and parasympathetic nervous system (ANS)

Sense organs - Anatomy and physiology of Eye, Ear, Skin, Tongue, Nose

Urinary system : Anatomy and physiology of urinary system Physiology of urine formation, Renin-angiotensin system, Clearance tests and micturition

Endocrine system (Hormones and their functions) : Pituitary gland, Adrenal gland, Thyroid and parathyroid gland, Pancreas and gonads

Reproductive system : Anatomy of male and female reproductive system, Physiology of menstruation, Spermatogenesis and Oogenesis, Pregnancy and parturition

SOCIAL PHARMACY

Introduction to Social Pharmacy : Definition and Scope. Social Pharmacy as a discipline and its scope in improving the public health. Role of Pharmacists in Public Health. Concept of Health - WHO Definition, various dimensions, determinants, and health indicators. National Health Policy - Indian perspective Public and Private Health System in India, National Health Mission. Introduction to Millennium Development Goals, Sustainable Development Goals, FIP Development Goals

Preventive healthcare - Role of Pharmacists in the following : Demography and Family Planning, Mother and child health, importance of breastfeeding, ill effects of infant milk substitutes and bottle feeding, Overview of Vaccines, types of immunity and Immunization

Effect of Environment on Health - Water pollution, importance of safe drinking water, waterborne diseases, air pollution, noise pollution, sewage and solid waste disposal occupational illnesses, Environmental pollution due to pharmaceuticals

Psychosocial Pharmacy : Drugs of misuse and abuse -psychotropic, narcotics, alcohol, tobacco products. Social Impact of these habits on social health and productivity and suicidal behaviors

Nutrition and Health : Basics of nutrition - Macronutrients and Micronutrients. Importance of water and fibres in diet, Balanced diet, Malnutrition, nutrition deficiency diseases, ill effects of junk foods, calorific and nutritive values of various foods, fortification of food, Introduction to food safety, adulteration of foods, effects of artificial ripening, use of pesticides, genetically modified foods, Dietary supplements, nutraceuticals, food supplements, indications, benefits, Drug-Food Interactions Introduction to Microbiology and common microorganisms

Epidemiology : Introduction to epidemiology and its applications. Understanding of terms such as epidemic, pandemic, endemic, mode of transmission, outbreak, quarantine, isolation, incubation period, contact tracing, morbidity, mortality, Causative agents, epidemiology and clinical presentations, Arthropod-borne infections - dengue, malaria, filariasis and chikungunya

Surface infections - trachoma, tetanus, leprosy STDs, HIV/AIDS Introduction to health systems and all ongoing National Health programs in India, their objectives, functioning, outcome, and the role of pharmacists

Pharmacoeconomics- Introduction, basic terminologies, importance of pharmacoeconomics

PHARMACOLOGY

General Pharmacology : Introduction and scope of Pharmacology, Various routes of drug administration - advantages and disadvantages, Drug absorption - definition, types, factors affecting drug absorption, Bioavailability and the factors affecting bioavailability, Drug distribution - definition, factors affecting drug

Distribution, Biotransformation of drugs - Definition, types of biotransformation reactions, factors influencing drug metabolisms Excretion of drugs - Definition, routes of drug excretion, General mechanisms of drug action and factors modifying drug action

Drugs Acting on the Peripheral Nervous System : Steps involved in neurohumoral transmission, Definition, classification, pharmacological actions, dose, indications, and contraindications of Cholinergic drugs, Anti-Cholinergic drugs, Adrenergic drugs, Anti-adrenergic drugs, Neuromuscular blocking agents, Drugs used in Myasthenia gravis, Local anesthetic agents, Non Steroidal Anti-Inflammatory drugs (NSAIDs)

Drugs Acting on the Eye : Definition, classification, pharmacological actions, dose, indications and contraindications of- Miotics, Mydriatics, Drugs used in Glaucoma

Drugs Acting on the Central Nervous System

Definition, classification, pharmacological actions, dose, indications, and contraindications of General anesthetics, Hypnotics and sedatives, Anti-Convulsant drugs, Anti-anxiety drugs, Antidepressant drugs, Anti-psychotics, Nootropic agents, centrally acting muscle relaxants, Opioid analgesics.

Drugs Acting on the Cardiovascular System : Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-hypertensive drugs, Anti-anginal drugs, Antiarrhythmic drugs, Drugs used in atherosclerosis and, Congestive heart failure, Drug therapy for shock

Drugs Acting on Blood and Blood Forming Organs : Definition, classification, pharmacological actions, dose, indications, and contraindications of Hematinic agents, Anti-coagulants, Antiplatelet agents, Thrombolytic drugs Definition, classification, pharmacological actions, dose, indications, and contraindications of Bronchodilators, Expectorants, Anti-tussive agents, Mucolytic agents

Drugs Acting on the Gastro Intestinal Tract : Definition, classification, pharmacological actions, dose indications, and contraindications of Anti-ulcer drugs, Anti-emetics Laxatives and purgatives, Anti-diarrheal drugs

Drugs Acting on the Kidney

Definition, classification, pharmacological actions, dose, indications, and contraindications of Diuretics, Anti-Diuretics

Hormones and Hormone Antagonists

Physiological and pathological role and clinical uses of Thyroid hormones, Anti-thyroid drugs, Parathormone, Calcitonin, Vitamin D, Insulin, Oral hypoglycemic agents, Estrogen, Progesterone, Oxytocin, Corticosteroids

Autocoids : Physiological role of Histamine, 5 HT and Prostaglandins Classification, clinical uses, and adverse effects of antihistamines and 5 HT antagonists

Chemotherapeutic Agents : Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to following classes : - Penicillins, Cephalosporins, Aminoglycosides, Fluoroquinolones, Macrolides, Tetracyclines Sulphonamides, Anti-tubercular drugs, Anti-fungal drugs, Anti-viral drugs, Anti-amoebic agents, Anthelmintics, Anti-malarial agents, Anti-neoplastic agents. Biologicals : Definition, types, and indications of biological agents with examples

COMMUNITY PHARMACY AND MANAGEMENT

Community Pharmacy Practice - Definition, history and development of community pharmacy - International and Indian scenarios. Professional responsibilities of community pharmacists. Introduction to the concept of Good Pharmacy Practice and SOPs

Prescription and prescription handling : Definition, parts of prescriptions, legality of prescriptions, prescription handling, labeling of dispensed medications (Main label, ancillary label, pictograms), brief instructions on medication usage Dispensing process, Good Dispensing Practices, dispensing errors and strategies to minimize them

Communication skills : Definition, types of communication skills. Interactions with professionals and patients. Verbal communication skills (one-to-one, over the telephone), written communication skills. Body language, Patient interview techniques

Patient counseling : Definition and benefits of patient counselling, Stages of patient counselling - Introduction, counselling, content, counselling process, and closing the counseling session

Barriers to effective counseling- Types and strategies to overcome the barriers Patient counselling points for chronic diseases/disorders - Hypertension, Diabetes, Asthma, Tuberculosis, Chronic obstructive pulmonary disease, and AIDS

Patient Package Inserts- Definition, importance and benefits, Scenarios of PPI use in India and other countries

Patient Information leaflets- Definition and uses

Medication Adherence

Definition, factors influencing non- adherence, strategies to overcome non adherence

Health Screening Services in Community Pharmacy

Introduction, scope, and importance of various health screening services - for routine monitoring of patients, early detection, and referral of undiagnosed cases

Over The Counter (OTC) Medications : Definition, need and role of Pharmacists in OTC medication dispensing, OTC medications in India, counseling for OTC products, Self-medication and role of pharmacists in promoting the safe practices during self-medication, Responding to symptoms, minor ailments, and advice for self-care in conditions such as - Pain management Cough, Cold, Diarrhea, Constipation, Vomiting, Fever, Sore throat, Skin disorders, Oral health (mouth ulcers, dental pain, gum swelling)

Community Pharmacy Management : Legal requirements to set up a community pharmacy, Site selection requirements, Pharmacy designs and interiors, Vendor selection and ordering, Procurement, inventory control methods, and inventory Management, Financial planning and management, Accountancy in community pharmacy - Day book, Cashbook, Introduction to pharmacy operation software's - usefulness and availability Customer Relation Management (CRM), Audits in Pharmacies, SOP of Pharmacy Management, Introduction to Digital Health, mHealth and Online pharmacies.

BIOCHEMISTRY & CLINICAL PATHOLOGY

Introduction to biochemistry : Scope of biochemistry in pharmacy. Cell and its biochemical organization

Carbohydrates : Definition, classification with examples, chemical Properties, Mono saccharides - Structure of glucose, fructose, and Galactose, Disaccharides - structure of maltose, lactose, and Sucrose, Polysaccharides - chemical nature of starch and Glycogen, Qualitative tests and biological role of carbohydrates

Proteins : Definition, classification of proteins based on composition and solubility with examples Definition, classification of amino acids based on chemical nature and nutritional requirements with examples. Structure of proteins (four levels of organization of protein structure). Qualitative tests and biological role of proteins and amino acids. Diseases related to malnutrition of proteins

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Lipids : Definition, classification with examples. Structure and properties of triglycerides (oils and fats). Fatty acid classification - Based on chemical and nutritional requirements with examples, structure and functions of cholesterol in the body. Lipoproteins - types, composition and functions in the body. Qualitative tests and functions of lipids

Nucleic acids : Definition, purine and pyrimidine bases, Components of nucleosides and nucleotides with examples, Structure of DNA (Watson and Crick model), RNA and their functions

Enzymes : Definition, properties and IUB and MB classification, Factors affecting enzyme activity, Mechanism of action of enzymes, Enzyme inhibitors, Therapeutic and pharmaceutical importance of enzymes

Vitamins : Definition and classification with examples. Sources, chemical nature, functions, coenzyme form recommended dietary requirements, deficiency diseases of fat-and water-soluble vitamins Metabolism (Study of cycle/pathways without chemical structures).

Metabolism of Carbohydrates : Glycolysis, TCA cycle and glycogen metabolism, regulation of blood glucose level. Diseases related to abnormal metabolism of Carbohydrates

Metabolism of lipids : Lipolysis, β -oxidation of Fatty acid (Palmitic acid) ketogenesis and ketolysis. Diseases related to abnormal metabolism of lipids such as Ketoacidosis, Fatty liver, Hypercholesterolemia

Metabolism of Amino acids (Proteins) : General reactions of amino acids and its significance- Transamination, deamination, Urea cycle and decarboxylation. Diseases related to abnormal metabolism of amino acids. Disorders of ammonia metabolism phenylketonuria, alkaptonuria and Jaundice

Biological oxidation : Electron transport chain and Oxidative phosphorylation

Minerals : Types, Functions, Deficiency diseases recommended dietary requirements

Water and Electrolytes : Distribution, functions of water in the body, Water turnover and balance, Electrolyte composition of the body fluids, Dietary intake of electrolyte and Electrolyte balance, Dehydration, causes of dehydration and oral rehydration therapy

Introduction to Biotechnology

Organ function tests : Functions of kidney and routinely performed tests to assess the functions of kidney and their clinical significances. Functions of liver and routinely performed tests to assess the functions of liver and their clinical significances. Lipid profile tests and its clinical significances

Introduction to Pathology of Blood and Urine : Lymphocytes and Platelets, their role in health and disease Erythrocytes - Abnormal cells and their significance, Normal and Abnormal constituents of Urine and their significance

PHARMACOTHERAPEUTICS

Pharmacotherapeutics - Introduction, scope, and objectives. Rational use of Medicines, Evidence Based Medicine, Essential Medicines List, Standard Treatment Guidelines (STGs) Definition, etiopathogenesis, clinical manifestations, nonpharmacological and pharmacological management of the diseases

Cardiovascular System : Hypertension, Angina and Myocardial infarction, Hyperlipidaemia, Congestive Heart Failure

Respiratory System : Asthma, COPD

Endocrine System : Diabetes, Thyroid disorders - Hypo and Hyperthyroidism

Central Nervous System : Epilepsy, Parkinson's disease, Alzheimer's disease, Stroke, Migraine

Gastro Intestinal Disorders : Gastro oesophageal reflux disease, Peptic Ulcer Disease, Alcoholic liver disease, Inflammatory Bowel Diseases (Crohn's Disease and Ulcerative Colitis)

Haematological disorders : Iron deficiency anaemia, Megaloblastic anaemia

Infectious diseases : Tuberculosis, Pneumonia, Urinary tract infections, Hepatitis, Gonorrhoea and Syphilis, Malaria, HIV and Opportunistic infections, Viral Infections (SARS, CoV2)

Musculoskeletal disorders : Rheumatoid arthritis, Osteoarthritis

Dermatology : Psoriasis, Scabies, Eczema

Psychiatric Disorders : Depression, Anxiety, Psychosis

Ophthalmology : Conjunctivitis (bacterial and viral), Glaucoma

Anti-microbial Resistance

Women's Health : Polycystic Ovary Syndrome, Dysmenorrhea, Premenstrual Syndrome

HOSPITAL AND CLINICAL PHARMACY

Hospital Pharmacy : Definition, scope, national and international scenario. Organizational structure, Professional responsibilities, Qualification and experience requirements, job specifications, work load requirements and inter professional relationships, Good Pharmacy Practice (GPP) in hospital, Hospital Pharmacy Standards (FIP Basel Statements, AHSP), Introduction to NAQS guidelines and NABH Accreditation and Role of Pharmacists

Different Committees in the Hospital : Pharmacy and Therapeutics Committee - Objectives Composition, and functions, Hospital Formulary - Definition, procedure for development and use of hospital formulary

Infection Control Committee - Role of Pharmacist in preventing Antimicrobial Resistance

Supply Chain and Inventory Control : Preparation of Drug lists - High Risk drugs, Emergency drugs, Schedule H1 drugs, NDPS drugs, reserved antibiotics

Procedures of Drug Purchases - Drug selection, short-term, long term, and tender/e-tender process, quotations, etc.

Inventory control techniques : Economic Order Quantity, Reorder Quantity Level, Inventory Turnover etc.

Inventory Management of Central Drug Store - Storage conditions, Methods of storage, Distribution, Maintaining Cold Chain, Devices used for cold storage (Refrigerator, ILR, Walk-in Cold rooms)

FEFO FIFO methods Expiry drug removal and handling and disposal. Disposal of Narcotics, cytotoxic drugs. Documentation - purchase and inventory

Drug distribution : Drug distribution (in- patients and out - patients) -Definition, advantages and disadvantages of individual prescription order method, Floor Stock Method, Unit Dose Drug Distribution Method, Drug Basket Method. Distribution of drugs to ICCU/ ICU /NICU/ Emergency wards.

Automated drug dispensing systems and devices

Distribution of Narcotic and Psychotropic substances and their storage compounding in Hospitals
Bulk compounding, IV admixture services and incompatibilities, Total parenteral nutrition

Radio Pharmaceuticals - Storage, dispensing and disposal of radiopharmaceuticals

Application of computers in Hospital Pharmacy Practice, Electronic health records, Software's used in hospital pharmacy

Clinical Pharmacy : Definition, scope, and development - in India and other countries Technical definitions, common terminologies used in clinical settings and their significance such as Pediatrics, Geriatric, Anti-natal Care, Post-natal Care, etc.

Daily activities of clinical pharmacists : Definition, goal, and procedure of : - Ward round participation, Treatment Chart Review, Adverse drug reaction monitoring, Drug information and poisons information, Medication history, Patient counseling, Inter professional collaboration

Pharmaceutical care : Definition, classification of drug related problems. Principles and procedure to provide pharmaceutical care

Medication Therapy Management, Home Medication Review

Clinical laboratory tests used in the evaluation of disease states - significance and interpretation of test results Hematological, Liver function, Renal function, thyroid function tests, Tests associated with cardiac disorders, Fluid and electrolyte balance, Pulmonary Function Tests

Poisoning : Types of poisoning : Clinical manifestations and Antidotes

Drugs and Poison Information Centre and their services-Definition, Requirements, Information resources with examples and their advantages and disadvantages

Pharmacovigilance : Definition, aim and scope, Overview of Pharmacovigilance

Medication errors : Definition, types, consequences, and strategies to minimize medication errors, LASA drugs and Tallman lettering as per ISMP

Drug Interactions : Definition, types, clinical significance of drug interactions

PHARMACY LAW AND ETHICS

General Principles of Law, History and various Acts related to Drugs and Pharmacy profession

Pharmacy Act-1948 and Rules : Objectives, Definitions, Pharmacy Council of India, its constitution and functions, Education Regulations, State and Joint state pharmacy

Councils Registration of Pharmacists, Offences and Penalties. Pharmacy Practice Regulations 2015

Drugs and Cosmetics Act 1940 and Rules 1945 and New Amendments : Objectives, Definitions, Legal definitions of schedules to the Act and Rules Import of drugs - Classes of drugs and cosmetics prohibited from import, Import under license or permit

Manufacture of drugs - Prohibition of manufacture and sale of certain drugs, Conditions for grant of license and conditions of license for manufacture of drugs, Manufacture of drugs for test, examination and analysis, manufacture of new drug, loan license and repacking license

Sale of Drugs – Wholesale, Retail sale and Restricted license, Records to be kept in a pharmacy. Drugs Prohibited for manufacture and sale in India

Administration of the Act and Rules – Drugs Technical Advisory Board, Central Drugs Laboratory, Drugs Consultative Committee, Government analysts, licensing authorities, controlling authorities, Drug Inspectors

Narcotic Drugs and Psychotropic Substances Act 1985 and Rules

Objectives, Definitions, Authorities and Officers, Prohibition, Control and Regulation, Offences and Penalties

Drugs and Magic Remedies (Objectionable Advertisements) Act 1954

Objectives, Definitions, Prohibition of certain advertisements, Classes of Exempted advertisements, Offences and Penalties

Prevention of Cruelty to Animals Act-1960 : Objectives, Definitions, CPCSEA - brief overview, Institutional Animal Ethics Committee, Breeding and Stocking of Animals, Performance of Experiments, Transfer and Acquisition of animals for experiment, Records, Power to suspend or revoke registration, Offences and Penalties

Poisons Act-1919 : Introduction, objective, definition, possession, possession for sales and sale of any poison, import of poisons

FSSAI (Food Safety and Standards Authority of India) Act and Rules : brief overview and aspects related to manufacture, storage, sale, and labelling of Food Supplements

National Pharmaceutical Pricing Authority : Drugs Price Control Order (DPCO) - 2013. Objectives, Definitions, Sale prices of bulk drugs, Retail price of formulations, Retail price and ceiling price of scheduled formulations, Pharmaceutical Policy 2002, National List of Essential Medicines (NLEM)

Code of Pharmaceutical Ethics : Definition, ethical principles, ethical problem solving, registration, code of ethics for Pharmacist in relation to his job, trade, medical profession and his profession, Pharmacist's oath

Medical Termination of Pregnancy Act and Rules – basic understanding, salient features, and Amendments

Role of all the government pharma regulator bodies –Central Drugs Standards Control Organization (CDSCO), Indian Pharmacopoeia Commission (IPC)

Good Regulatory practices (documentation, licenses, renewals, e-governance) in Community Pharmacy, Hospital pharmacy, Pharma Manufacturing, Wholesale business, inspections, import, export of drugs and medical devices

Introduction to BCS system of classification, Basic concepts of Clinical Trials, ANDA, NDA, New Drug development, New Drugs and Clinical Trials Rules, 2019. Brand v/s Generic, Trade name concept, Introduction to Patent Law and Intellectual Property Rights, Emergency Use Authorization

Blood bank – basic requirements and functions

Clinical Establishment Act and Rules – Aspects related to Pharmacy

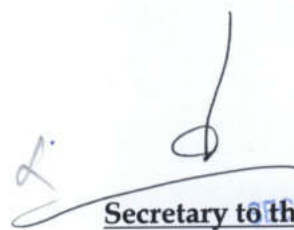
Biomedical Waste Management Rules 2016 – Basic aspects and aspects related to pharma manufacture to disposal of pharma / medical waste at homes, pharmacies, and hospitals

Bioethics - Basic concepts, history and principles. Brief overview of ICMR's National Ethical Guidelines for Biomedical and Health Research involving human Participants

Introduction to the Consumer Protection Act

Introduction to the Disaster Management Act

Medical Devices – Categorization, basic aspects related to manufacture and sale


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