

CGHS Pharmacist Exam 2024 Syllabus (Detailed Version)

A. Pharma Syllabus

1. General Pharmacology

- **Introduction to Pharmacology:**
 - Definitions, scope, and importance of pharmacology.
 - Historical development and milestones in pharmacology.
- **Pharmacokinetics:**
 - **Absorption:** Factors affecting drug absorption, routes of administration (oral, parenteral, topical, etc.).
 - **Distribution:** Plasma protein binding, volume of distribution, tissue permeability, blood-brain barrier.
 - **Metabolism:** Phases of drug metabolism, role of liver enzymes, first-pass effect.
 - **Excretion:** Renal and non-renal excretion, factors influencing drug excretion.
- **Pharmacodynamics:**
 - Mechanisms of drug action: Receptors, agonists, antagonists, enzyme inhibition.
 - Dose-response relationship: Graded and quantal dose-response curves.
 - Therapeutic index, drug efficacy, and potency.
- **Adverse Drug Reactions (ADR):**
 - Types of ADRs: Type A (augmented) and Type B (bizarre) reactions.
 - Mechanisms of ADRs: Immunological, genetic, and idiosyncratic reactions.
 - Management and reporting of ADRs, pharmacovigilance.
- **Drug Interactions:**
 - Types: Pharmacokinetic, pharmacodynamic, and pharmaceutical interactions.
 - Clinical significance and prevention of harmful drug interactions.
- **New Drug Development and Approval Process:**
 - Phases of clinical trials, regulatory requirements, and post-marketing surveillance.

2. Pharmacognosy

- **Introduction to Pharmacognosy:**
 - Definition, history, and importance of pharmacognosy in modern medicine.

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- **Sources of Drugs:**
 - **Natural Sources:** Plants (alkaloids, glycosides, tannins), animals (hormones, enzymes), minerals, marine organisms.
 - **Synthetic Sources:** Development and significance of synthetic drugs.
- **Methods of Drug Extraction:**
 - **Preparation of Extracts:** Types of extracts (aqueous, alcoholic, etc.), percolation, maceration, and Soxhlet extraction.
 - **Tinctures and Infusions:** Preparation methods, advantages, and disadvantages.
- **Classification of Crude Drugs:**
 - **Chemical Constituents:** Alkaloids, glycosides, terpenoids, steroids, flavonoids, tannins.
 - **Taxonomic Classification:** Based on botanical family, genus, and species.
- **Detailed Study of Crude Drugs:**
 - **Selected Crude Drugs:**
 - **Cinchona:** Source, chemical constituents (quinine, quinidine), therapeutic uses.
 - **Digitalis:** Source, active principles (digoxin, digitoxin), pharmacological actions.
 - **Senna:** Source, chemical constituents (sennosides), laxative properties.
 - **Ephedra:** Source, ephedrine alkaloids, used in bronchial asthma.
 - **Other Notable Drugs:** Belladonna, Ipecacuanha, Liquorice, etc.
- **Quality Control of Crude Drugs:**
 - **Adulteration:** Types of adulteration (sophistication, substitution, inferiority), methods of detection.
 - **Evaluation Techniques:** Organoleptic, microscopic, chemical, and physical evaluation.

3. Pharmaceutical Chemistry

- **Basic Concepts:**
 - Atomic structure, quantum numbers, chemical bonding (ionic, covalent, hydrogen bonds).
 - Periodic table trends, electronegativity, oxidation states.
- **Organic Chemistry:**

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- Functional groups: Alcohols, aldehydes, ketones, carboxylic acids, amines.
- **Isomerism:** Structural isomerism, stereoisomerism, geometrical isomerism.
- **Stereochemistry:** Chirality, optical isomerism, enantiomers, and diastereomers.
- **Medicinal Chemistry:**
 - **SAR (Structure-Activity Relationship):** Analysis of the relationship between chemical structure and pharmacological activity.
 - **Drug Design:** Rational drug design, prodrugs, and combinatorial chemistry.
 - **Classes of Drugs:** Antihypertensives, antibiotics, analgesics, antineoplastics, etc.
- **Inorganic Pharmaceuticals:**
 - **Radiopharmaceuticals:** Uses in diagnostics and treatment, safety and handling.
 - **Essential and Trace Elements:** Role of iron, zinc, magnesium, and calcium in the body, deficiency diseases.
- **Biochemistry:**
 - **Enzymes:** Mechanism of action, enzyme kinetics, factors affecting enzyme activity.
 - **Vitamins:** Classification (water-soluble and fat-soluble), functions, deficiency symptoms.
 - **Carbohydrates:** Structure, classification, metabolism (glycolysis, gluconeogenesis).
 - **Proteins:** Structure, amino acids, protein synthesis, and degradation.
 - **Lipids:** Types, functions, metabolism (β -oxidation, lipogenesis).

4. Pharmaceutics

- **Introduction to Dosage Forms:**
 - **Solid Dosage Forms:** Tablets, capsules, powders, granules – formulation and evaluation.
 - **Liquid Dosage Forms:** Solutions, syrups, suspensions, emulsions – preparation and stability.
 - **Semisolid Dosage Forms:** Ointments, creams, gels – formulation, application, and evaluation.
 - **Specialised Dosage Forms:** Transdermal patches, sustained-release formulations, nanomedicines.

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- **Preparation and Packaging:**
 - **Manufacturing Processes:** Compression, coating, encapsulation, aseptic techniques.
 - **Packaging Materials:** Glass, plastic, metal – properties and selection criteria.
- **Sterilisation:**
 - **Methods:** Autoclaving, dry heat, filtration, gas sterilisation, radiation.
 - **Principles:** Sterility assurance level (SAL), validation of sterilisation processes.
- **Biopharmaceutics:**
 - **Bioavailability:** Factors affecting bioavailability, measurement and improvement techniques.
 - **Bioequivalence:** Importance in generic drug development, regulatory guidelines.
 - **Pharmacokinetics in Formulation Development:** Role in dosage regimen design.
- **Pharmaceutical Calculations:**
 - **Dilution and Concentration:** Calculations involving percentage strength, molarity, normality.
 - **Isotonic Solutions:** Calculation of isotonicity, preparation of isotonic solutions.
 - **Other Calculations:** Allegation, displacement value, pharmaceutical compounding.

5. Hospital & Clinical Pharmacy

- **Hospital Pharmacy:**
 - **Organization and Structure:** Functions and responsibilities of a hospital pharmacist.
 - **Drug Distribution Systems:** Unit dose system, floor stock system, automated dispensing systems.
 - **Inventory Control:** ABC analysis, VED analysis, perpetual inventory.
 - **Compounding and Dispensing:** Techniques, labelling, storage requirements.
 - **Drug Formulary:** Preparation, maintenance, and importance in hospital settings.
- **Clinical Pharmacy:**

- **Patient Counselling:** Importance, techniques, communication skills.
- **Drug Therapy Monitoring:** Therapeutic drug monitoring (TDM), dosage adjustment, monitoring drug interactions.
- **Medication Adherence:** Factors affecting adherence, strategies to improve compliance.
- **Drug Information Services:**
 - **Sources of Drug Information:** Primary, secondary, and tertiary sources.
 - **Retrieval of Information:** Use of databases (PubMed, Medline), drug information software.
 - **Communication of Information:** Preparing drug monographs, patient information leaflets.
- **Therapeutic Drug Monitoring:**
 - **Principles and Techniques:** Blood sampling, analytical methods (HPLC, immunoassay).
 - **Clinical Applications:** Monitoring of drugs with narrow therapeutic index (e.g., digoxin, lithium).
- **Rational Use of Medicines:**
 - **Essential Drugs Concept:** WHO model list, national essential drug lists.
 - **Pharmacoeconomics:** Cost-effectiveness analysis, cost-benefit analysis in drug therapy.

6. Human Anatomy & Physiology

- **Blood:**
 - **Composition:** Plasma, red blood cells (RBCs), white blood cells (WBCs), platelets.
 - **Functions:** Oxygen transport, immunity, clotting, and waste removal.
 - **Blood Groups:** ABO system, Rh factor, blood transfusion principles.
 - **Hemostasis:** Mechanism of blood clotting, coagulation cascade, anticoagulants.
- **Nervous System:**
 - **Central Nervous System (CNS):** Structure and functions of the brain (cerebrum, cerebellum, brainstem) and spinal cord.
 - **Peripheral Nervous System (PNS):** Nerve structure, classification (cranial nerves, spinal nerves), reflex arcs.

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- **Autonomic Nervous System (ANS):** Sympathetic and parasympathetic divisions, neurotransmitters, and their actions.
- **Neurotransmission:** Mechanism, synaptic transmission, neurotransmitters (acetylcholine, dopamine, serotonin).
- **Respiratory System:**
 - Anatomy of the Respiratory Tract: Nasal cavity, pharynx, larynx, trachea, bronchi, lungs.
 - Mechanism of Breathing: Inspiration, expiration, respiratory muscles.
 - Gas Exchange: Alveolar exchange of gases, oxygen transport, carbon dioxide transport.
 - Regulation of Respiration: Neural and chemical control, respiratory centres in the brain.
- **Digestive System:**
 - Anatomy of the Digestive Tract: Oral cavity, oesophagus, stomach, intestines, liver, pancreas, gallbladder.
 - Digestion and Absorption: Mechanical and chemical digestion, nutrient absorption in the small intestine.
 - Metabolism: Carbohydrate, protein, lipid metabolism, role of the liver in metabolism.
 - Disorders: Common disorders of the digestive system (ulcers, gallstones, hepatitis).
- **Renal System:**
 - Anatomy of the Kidneys: Structure of the nephron, blood supply to the kidneys.
 - Functions of the Kidneys: Filtration, reabsorption, secretion, urine formation.
 - Regulation of Fluid and Electrolyte Balance: Role of the kidneys in maintaining homeostasis.
 - Acid-Base Balance: Mechanisms of pH regulation, role of kidneys and lungs.
- **Endocrine System:**
 - Overview of Endocrine Glands: Pituitary, thyroid, parathyroid, adrenal glands, pancreas, gonads.
 - Hormones: Mechanism of hormone action, feedback regulation, role in metabolism and homeostasis.
 - Disorders: Common endocrine disorders (diabetes, hyperthyroidism, hypothyroidism).

7. Microbiology

- **Introduction to Microorganisms:**
 - Classification: Bacteria, viruses, fungi, protozoa, and prions.
 - Morphology: Bacterial shapes, structure of viruses, fungal hyphae.
 - Growth and Reproduction: Binary fission in bacteria, viral replication, fungal reproduction.
- **Sterilisation Techniques:**
 - **Physical Methods:** Heat (moist and dry heat), filtration, radiation (UV, gamma rays).
 - **Chemical Methods:** Use of disinfectants, antiseptics, alcohols, aldehydes, and halogens.
 - **Validation:** Techniques for monitoring sterilisation (biological indicators, chemical indicators).
- **Immunology:**
 - **Immune System:** Innate and adaptive immunity, components of the immune system (lymphocytes, antibodies).
 - **Antigen-Antibody Reactions:** Agglutination, precipitation, complement fixation, ELISA.
 - **Vaccines:** Types (live attenuated, inactivated, subunit, conjugate), immunisation schedules.
 - **Hypersensitivity Reactions:** Types I-IV, mechanisms, examples (allergies, autoimmune diseases).
- **Pathogenic Microorganisms:**
 - **Bacteria:** Pathogenesis, examples (Mycobacterium tuberculosis, Streptococcus pneumoniae).
 - **Viruses:** Mechanisms of viral infection, examples (HIV, hepatitis viruses, influenza).
 - **Fungi:** Pathogenesis, examples (Candida, Aspergillus).
 - **Protozoa:** Pathogenesis, examples (Plasmodium, Entamoeba histolytica).
- **Laboratory Techniques:**
 - **Culture Media:** Types (selective, differential, enrichment), preparation, and use.
 - **Staining Techniques:** Gram staining, acid-fast staining, fungal staining.
 - **Identification Methods:** Biochemical tests, molecular techniques (PCR, sequencing).

8. Pharmaceutical Jurisprudence

- **Drug Acts and Regulations:**
 - **Drugs and Cosmetics Act, 1940:** Provisions related to the manufacture, sale, and distribution of drugs.
 - **Pharmacy Act, 1948:** Regulation of the pharmacy profession, registration of pharmacists.
 - **Narcotic Drugs and Psychotropic Substances Act, 1985:** Control and regulation of narcotic drugs.
 - **Drugs Price Control Order (DPCO):** Price regulation of essential drugs.
- **Regulatory Authorities:**
 - **CDSCO (Central Drugs Standard Control Organization):** Role in drug approval, clinical trials, quality control.
 - **State Pharmacy Councils:** Functions, role in maintaining ethical pharmacy practice.
 - **Pharmacovigilance Program of India (PvPI):** ADR monitoring and reporting.
- **Prescription Handling:**
 - Legal aspects of prescription writing, elements of a valid prescription.
 - Ethical considerations in dispensing medications, patient confidentiality.
- **Consumer Protection Act, 2019:**
 - Rights and responsibilities of consumers, grievance redressal mechanisms.
 - Role of pharmacists in protecting consumer rights.
- **Intellectual Property Rights (IPR):**
 - **Patents:** Process of obtaining a patent, types of patents (product, process).
 - **Trademarks:** Importance in branding, legal protection.
 - **Trade Secrets:** Definition, protection strategies.

9. Clinical Toxicology

- **Introduction to Toxicology:**
 - Definition, scope, and importance in clinical practice.
 - **Toxic Agents:** Classification (chemical, biological, physical), sources of exposure.
- **Management of Poisoning:**
 - **General Principles:** Decontamination, supportive care, use of antidotes.

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- **Specific Antidotes:** For common poisons (e.g., atropine for organophosphates, naloxone for opioids).
- **Chelation Therapy:** For heavy metal poisoning (lead, mercury, arsenic).
- **Environmental Toxicology:**
 - **Pollution:** Air, water, soil pollution, sources, health effects.
 - **Toxicants:** Industrial chemicals, pesticides, heavy metals.
 - **Prevention:** Regulatory measures, occupational safety practices.
- **Occupational Hazards:**
 - **Chemical Hazards:** Exposure to solvents, heavy metals, pesticides.
 - **Biological Hazards:** Exposure to pathogens, prevention of occupational diseases.
 - **Physical Hazards:** Radiation, noise, ergonomic risks.
- **Toxicity Testing:**
 - **In vitro Testing:** Cell culture methods, cytotoxicity assays.
 - **In vivo Testing:** Animal models, acute and chronic toxicity studies.
 - **Regulatory Requirements:** GLP (Good Laboratory Practice), ethical considerations in animal testing.

10. Health Education and Community Pharmacy

- **Public Health:**
 - **Concepts of Health and Disease:** Definitions, determinants of health, natural history of disease.
 - **National Health Programs:** Key programs (RNTCP, National AIDS Control Program, Universal Immunization Program).
 - **Role of Pharmacists:** In public health, disease prevention, health promotion.
- **Family Planning:**
 - **Methods of Contraception:** Barrier methods, hormonal methods, IUDs, sterilisation.
 - **Advantages and Disadvantages:** Counselling patients on method selection.
 - **Role of Pharmacists:** Providing contraceptive advice, dispelling myths, ensuring compliance.
- **First Aid:**
 - **Management of Common Emergencies:** Burns, fractures, poisoning, anaphylaxis.

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- **CPR (Cardiopulmonary Resuscitation):** Steps, techniques, use of AED (Automated External Defibrillator).
- **Wound Care:** Types of wounds, cleaning, dressing, prevention of infection.
- **Epidemiology:**
 - **Principles of Epidemiology:** Incidence, prevalence, morbidity, mortality rates.
 - **Disease Surveillance:** Importance, methods, notifiable diseases.
 - **Outbreak Management:** Steps in managing an outbreak, role of pharmacists.
- **Role of Pharmacists in Healthcare:**
 - **Community Pharmacy Practices:** Dispensing, counselling, patient education.
 - **Public Health Initiatives:** Participation in immunisation drives, health camps, awareness programs.
 - **Pharmacy-Based Health Screenings:** Blood pressure, glucose monitoring, cholesterol screening.

11. Other Important Topics

- **Biostatistics:**
 - **Basic Concepts:** Overview and application in pharmacy.
 - **Descriptive Statistics:** Measures of central tendency (mean, median, mode) and dispersion (range, variance, standard deviation).
 - **Inferential Statistics:** Hypothesis testing, p-values, confidence intervals.
 - **Study Designs:** Observational (cohort, case-control) and experimental (randomised controlled trials).
- **Pharmacognosy:**
 - **Crude Drugs:** Classification and therapeutic uses.
 - **Extraction Methods:** Types (maceration, percolation), standardisation.
 - **Phytochemistry:** Study of plant constituents (alkaloids, glycosides).
- **Pharmaceutical Biotechnology:**
 - **Recombinant DNA Technology:** Gene cloning, recombinant proteins.
 - **Monoclonal Antibodies:** Production and applications.
 - **Vaccines:** Types (live, inactivated, subunit), production methods.
- **Pharmaceutical Analysis:**
 - **Analytical Techniques:** Spectrophotometry, chromatography.
 - **Quality Assurance:** Good Laboratory Practice (GLP), method validation.

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- **Clinical Pharmacy:**
 - **Pharmaceutical Care:** Medication therapy management, patient-centred approach.
 - **Drug Therapy Monitoring:** Therapeutic drug monitoring, ADR reporting.
 - **Patient Counselling:** Communication skills, counselling for chronic diseases.
- **Biopharmaceutics and Pharmacokinetics:**
 - **Drug Absorption:** Factors affecting absorption, bioavailability.
 - **Pharmacokinetics:** Basic concepts, compartment models, pharmacokinetic parameters.

B. Non-Pharma Syllabus

1. General Intelligence and Reasoning

- **Analogies:** Understanding relationships between different pairs of words or phrases and solving analogy problems.
- **Alphabetical and Number Series:** Identifying patterns and sequences in alphabetical and numerical series.
- **Coding and Decoding:** Deciphering coded messages and creating codes based on given patterns.
- **Mathematical Operations:** Performing basic arithmetic operations and solving problems involving these operations.
- **Relationships:** Analyzing and identifying relationships between various elements.
- **Syllogism:** Drawing logical conclusions from given premises, understanding different types of syllogistic reasoning.
- **Jumbling:** Arranging jumbled sentences or paragraphs to form a coherent passage.
- **Venn Diagram:** Using Venn diagrams to solve problems related to sets and their relationships.
- **Data Interpretation and Sufficiency:** Analyzing and interpreting data presented in various formats (graphs, tables) and determining the sufficiency of given data to answer questions.
- **Conclusions and Decision Making:** Drawing logical conclusions from given statements and making decisions based on provided information.
- **Similarities and Differences:** Identifying similarities and differences between given sets of items.
- **Analytical Reasoning:** Applying logical and analytical thinking to solve complex problems.

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- **Classification:** Categorizing items into groups based on common characteristics.
- **Directions:** Understanding and solving problems related to directions and distances.
- **Statement – Arguments and Assumptions:** Analyzing statements to identify underlying arguments and assumptions.

2. General Awareness

- **Knowledge of Current Affairs:** Staying updated with recent events and developments at national and international levels.
- **Indian Geography:** Understanding physical, political, and economic geography of India.
- **Culture and History of India:** Familiarity with India's cultural heritage, historical events, and freedom struggle.
- **Indian Polity and Constitution:** Knowledge of the Indian political system, constitution, and governance structures.
- **Indian Economy:** Basics of Indian economic policies, trends, and economic terms.
- **Current World Events:** Awareness of significant global events and developments.
- **Sports:** Information about major sports events, athletes, and achievements.
- **Indian Music, Dance & Culture:** Understanding various forms of Indian music, dance styles, and cultural practices.

3. English & Hindi Language

- **English:**
 - **One Word Substitution:** Replacing phrases or sentences with a single word.
 - **Synonyms and Antonyms:** Identifying words with similar or opposite meanings.
 - **Spelling Error:** Detecting and correcting spelling mistakes in words.
 - **Spotting Error in Sentences:** Identifying grammatical and syntactical errors in sentences.
 - **Grammar:** Understanding and applying rules related to nouns, pronouns, adjectives, verbs, prepositions, conjunctions, and articles ('A', 'AN', and 'THE').
 - **Idioms and Phrases:** Understanding and using common idioms and phrases.
 - **Comprehension:** Reading passages and answering questions based on the content.
- **Hindi:**

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- **Idioms and Phrases:** Understanding and using common Hindi idioms and phrases.
- **Correct the Sentences:** Identifying and correcting errors in Hindi sentences.
- **Fill in the Blanks:** Completing sentences with appropriate words.
- **Synonyms and Antonyms:** Identifying Hindi words with similar or opposite meanings.
- **One Word Substitution:** Replacing phrases or sentences with a single Hindi word.
- **Comprehension:** Reading Hindi passages and answering questions based on the content.

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