प्रदेश लोक सेवा आयोग

लुम्बिनी प्रदेश

प्रदेश निजामती सेवा तथा स्थानीय सरकारी सेवा अन्तर्गतको स्वास्थ्य सेवा, फार्मेसी समूह, सहायक पाँचौं तहको खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

पाठ्यक्रमको रुपरेखाः- यस पाठ्यक्रमको आधारमा निम्नानुसार चरणमा परीक्षा लिइने छः

प्रथम चरणः- लिखित परीक्षा **पूर्णाङ्कः-** १००

द्वितीय चरणः- अन्तर्वार्ता **पूर्णाङ्कः-** २०

प्रथम चरणः- लिखित परीक्षा योजना (Written Examination)

विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली	प्रश्न संख्या X अङ्कभार	समय
सेवा सम्बन्धी	१००	४०	वस्तुगत बहुवैकल्पिक	५० प्रश्न X २ अङ्क = १००	४५ मिनेट

द्वितीय चरणः-

विषय	पूर्णाङ्क	परीक्षा प्रणाली
अन्तर्वार्ता	२०	बोर्ड अन्तर्वार्ता (Board Interview)

द्रष्टव्यः-

१. बस्तुगत बैकल्पिक परीक्षामा यथासम्भव निम्नानुसार प्रश्नहरु सोधिनेछ ।

एकाइ	१	२	३	४	५	६	७	८	९
प्रश्न संख्या	५	५	७	७	४	५	४	८	५

२. वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरुको गलत उत्तर दिएमा प्रत्येक गलत उत्तर बापत २० प्रतिशत अङ्क कट्टा गरिनेछ । तर उत्तर नदिएमा त्यस बापत अङ्क दिइने छैन र अङ्क कट्टा पनि गरिने छैन।

३. यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भएतापनि पाठ्यक्रममा परेका कानून, ऐन, नियम तथा नीतिहरु परीक्षाको विज्ञापन हुदाँका वखत (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्क्रममा परेको सम्झन पर्दछ ।

४. प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरुलाई मात्र द्वितीय चरणको अन्तर्वार्तामा सम्मिलित गराइनेछ ।

५. बहुवैकल्पिक प्रश्नहरु हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन् ।

६. परीक्षमा परीक्षार्थीले मोबाइल वा यस्तै प्रकारका विद्युतीय उपकरण परीक्षा हलमा लैजान पाइने छैन् ।

७. पाठ्यक्रम लागू मितिः-

प्रदेश लोक सेवा आयोग

लुम्बिनी प्रदेश

प्रदेश निजामती सेवा तथा स्थानीय सरकारी सेवा अन्तर्गतको स्वास्थ्य सेवा, फार्मेसी समूह, सहायक पाँचौं तहको खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

(५० प्रश्न X २ अङ्क= १०० अङ्क)

1. सार्वजनिक व्यवस्थापन (Public Management)

1.1. कार्यालय व्यवस्थापन

1.1.1. कार्यालय : परिचय, महत्व, कार्य र प्रकार

1.1.2. सहायक कर्मचारीका कार्य र गुणहरु

1.1.3. कार्यालय स्रोत साधन (Office Resources): परिचय र प्रकार

1.1.4. कार्यालयमा सञ्चारको महत्व, किसिम र साधन

1.1.5. कार्यालय कार्यविधि(Office Procedure) पत्र व्यवहार (Correspondence), दर्ता र चलानी (Registration & Dispatch), परिपत्र (Circular), तोक आदेश(Order), टिप्पणी लेखन र टिप्पणी तयार पार्दा ध्यान दिनुपर्ने कुराहरु

1.1.6. अभिलेख व्यवस्थापन (Record Management)

1.2. निजामती सेवा ऐन र नियमावलीमा भएका देहायका व्यवस्थाहरु

1.2.1. निजामती सेवा, प्रदेश निजमती सेवा र स्थानीय सरकारी सेवाको गठन, संगठन संरचना, पदपूर्ति गर्ने तरिका र प्रक्रियाहरु

1.2.2. नेपाल सरकार प्रदेश सरकारको स्वास्थ्य संगठन संरचनाको बारेमा जानकारी

1.2.3. कर्मचारीको नियुक्ति, सरुवा, बढुवा, बिदा, विभागीय सजाय र अवकाश

1.2.4. कर्मचारीले पालन गर्नुपर्ने आचरण र कर्तव्यहरु

1.3. सरकारी बजेट, लेखा र लेखापरीक्षण प्रणाली सम्बन्धी सामान्य जानकारी

1.4. सार्वजनिक सेवा प्रवाहको अर्थ, सेवा प्रवाह गर्ने निकाय, तरिका र माध्यमहरु

1.5. सार्वजनिक बडापत्र (Public Charter) महत्व र आवश्यकता

1.6. व्यवस्थापनको अवधारणा तथा सार्वजनिक व्यवस्थापनमा निर्देशन, नियन्त्रण, समन्वय, निर्णय प्रक्रिया, उत्प्रेरणा र नेतृत्व सम्वन्धी जानकारी

1.7. मानवीय मूल्य मान्यता (Human Values), नागरिक कर्तव्य र दायित्व तथा अनुशासन

1.8. Basics of Computer Science (MS Word, Excel, Power Point)

1.9. स्वास्थ्य नीति २०७६, स्वास्थ सेवा ऐन २०५३, स्वास्थ्य सेवा नियमावली २०५५

1.10. लुम्बिनी प्रदेश स्वास्थ्य नीति २०७७, प्रदेश स्वास्थ्य संस्था स्थापना सञ्चालन नविकरण तथा स्तरोन्नति ऐन २०७५ र प्रदेश स्वास्थ्य संस्था स्थापना सञ्चालन नविकरण तथा स्तरोन्नति नियमावली २०७७

1.11. स्वास्थ्यकर्मीहरुको पेशागत परिषद् सम्बन्धी जानकारी र आचारसंहिता

2. Pharmaceutical Jurisprudence

2.1. History of pharmaceutical legislation, pharmaceutical industry, pharmaceutical education system of Nepal

2.2. Acts and Regulations

- Drugs Act, 2035
- Drug Consultation Council and Drug Advisory Regulation 2037
- Drug Registration Regulation 2038
- Drug Inspection Regulation 2040
- Drug Standard Regulation 2043
- Drug Manufacture Codes 2041
- Drug Sale and Distribution Codes 2071

- Good Manufacturing Practices (औषधी उत्पादन संहिता 2041)
- Pharmacy Council Act (NPC- 2057
- Hospital pharmacy guideline with amendment, National Health Policy,
- National Drug policy, Consumer Protection Act 2054
- Narcotic drug control act 2035
- Control of poisonous and hazardous chemical substances and their control mechanism, Pharmaceutical Institutions and organizations of Nepal and their function,
- Drugs banned in Nepal and the reason of drug banning
- Essential drug list of Nepal.

3. Pharmaceutics

3.1. Introduction to pharmaceutical preparation and dosage form

- Different pharmaceutical preparations and dosage forms (Tablet, Capsules, Aromatic Water, Cachets, colloids, Creams, Draughts, Dusting Powders, Dentifrices, Ear Drops, Elixir, Emulsions, Enemas, Eye Drops, Eye Lotions, Gargles, Gels, Glycerin, Granules, Effervescent Granules, Implants, Infusions, Inhalations, Injections, Insufflations, Irrigations, Jellies, Linctuses, Liniments, Lotions, Lozenges, Mixtures, Mouthwashes, Nasal Drops, Ointments, Ophthalmic Ointments, Paints, Paste, Pessaries, Powders, Solutions, Dispersible Tablets, Chewable tablets, Spirits, Sprays, Suppositories, Suspensions, Syrups, Tinctures)
- Novel drug delivery system, drug delivery systems. (Nasal, Transdermal, Pulmonary, Occular, Buccal, Post-oral, Vaginal and Intramuscular)

3.2. Pharmacopeias and formularies used in Nepal

- Pharmacopeias and their uses, British Pharmacopoeia, United States Pharmacopoeia, Indian Pharmacopoeia, British Pharmaceutical Codex, Japanese pharmacopeia, International Pharmacopoeia, European Pharmacopoeia, etc.

3.3. Weight and measures

- Weight and measure and convert from one system to another and one unit to another.
- Solve problems related to percentage and ratio strength, allegation method and isotonic solutions.

3.4. Comminution

- Comminution, objectives of size reduction, factors affecting size reduction, principles of size reduction with description of hammer mill, ball mill, fluid energy mill and colloid mill.

3.5. Size Separation

- Introduction of size separation,
- Pharmaceutical applications of size separations,
- Classification powders as per official standards
- Size separation by shifting and sedimentation methods.

3.6. Mixing and Homogenization

- Mixing and its pharmaceutical applications
- Liquid-liquid mixing,
- Semisolid – liquid mixing
- Semisolid – solid mixing
- Solid - liquid mixing and solid - solid mixing
- Function of the mixing equipment (Planetary Mixer, Triple Roller Mill, Colloid mill and Double cone mixer)

3.7. Filtration and clarification

- Filtration, theory and pharmaceutical applications of filtration
- Filter media and filtration aids

- Factors affecting the selection of filters
- Application of the Sintered filters, Filters candles, Filter press.

3.8. Extraction

- Extraction and concept of solid-liquid and liquid-liquid extractions
- Percolation and maceration and their modification
- Continuous hot extraction and Application in the preparation of tinctures and extracts
- Factors affecting the selection of extraction process.

3.9. Heat Process

- Heat, temperature and heat transfer
- Method of heat transfer
- Different heat processes
- Evaporation and its pharmaceutical application
- Evaporation still and evaporation pan
- Factors affecting evaporation.

3.10. Distillation

- Difference between distillation and evaporation
- Types of distillation (simple distillation, fractional distillation, steam distillation and vacuum distillation)
- Preparation of purified water and water for injection.

3.11. Drying process

- Drying and its pharmaceutical applications,
- Different types of dryers (tray dryer and fluidized bed dryers)

3.12. Physicochemical Principles of Pharmaceutics

- Viscosity and rheology
- Classification fluids based on its flow properties
- Newtonian fluids, concept of laminar, transitional and turbulent flows,
- Capillary and falling sphere viscometers,
- Concept of types of non-Newtonian flows (plastic, pseudoplastic and dilatants flow)
- Surface and interfacial tension and different methods of measurement
- Contact angle and its pharmaceutical applications,
- Surface-active agents their physical properties and their pharmaceutical applications,
- Colloids and their properties, application of colloids in pharmacy, different orders of reaction.
- Factors affecting the stability of pharmaceutical products.
- Different methods of determination of orders of reaction and graphical method of interpretation.
- Methods of accelerated stability testing and prediction of shelf life of the product.
- Guidelines for stability testing of pharmaceuticals.

3.13. Monophasic liquid dosage forms

- Monophasic liquid dosage form and its advantages and disadvantages
- Factors affecting solubility.
- Components of formulation with examples.
- Preparation of mixtures (Syrup, Elixirs, Linctuses, Drops, Draughts, Gargles, Mouth Washes, Throat paints, Sprays, Enemas, Douches, Ear drops, Nasal drops and sprays, Liniments and Lotions.)

3.14. Introduction to Biopharmaceutics

- Concept of bioavailability and biopharmaceutics,
- Basic concept of mechanism of drug transport across the gastrointestinal barrier,
- Different factors influencing bioavailability

- Plasma concentration – time curves of oral, i. V. Bolus and i. V. Infusion and Cumulative urinary drug excretion curve
- Absolute and relative bioavailability and bioequivalence.

3.15. Dispensing pharmacy

- Prescriptions, parts of prescription and its handling steps
- Latin terms commonly used
- Modern methods of prescribing
- Pharmaceutical Incompatibilities in prescriptions (physical, chemical and therapeutic incompatibilities)
- Posology, dose and dosage form, factors influencing dose
- Calculation of doses on the basis of age, sex and surface area.

4. Hospital And Clinical Pharmacy

4.1. Hospitals

- Hospital and its function: classify hospitals based on various criteria, organization, management and delivery system in Nepal.

4.2. Hospital Pharmacy

- Hospital pharmacy, functions and objectives of hospital pharmacy services
- Layout design of hospital and hospital pharmacy
- Regulatory and professional requirement for hospital pharmacy practice
- Requirements and abilities required for hospital pharmacists
- Drug distribution system in hospitals (outpatient services, in-patient services, types of services, Unit dose system, floor/ward stock system, satellite pharmacy system, bedside pharmacy.)

4.3. Central sterile services Department (CSSD) and extemporaneous compounding & dispensing

- Functions and objectives of CSSD
- Role of pharmacist in CSSD
- Hospital formulations (salicylic acid ointment, coal tar ointment, Whitefield ointment, iodine solution)
- Concept of Total Parenteral nutrients.

4.4. Drug and Therapeutic Committee

- Goals, objectives, structure, principle and Functions of the DTC, Hospital Formulary
- Hospital pharmacy Directives 2078.

4.5. Drug information

- sources of drug information, drug information services, Drug information bulletin,

4.6. Drug Store management

- Requirement of a drug storeroom and storage requirement of a general drugs including vaccines and narcotic drugs
- Principle of drug inventory management (ABC analysis, VED Analysis, FSN analysis, FIFO, FEFO)
- Handling of cytotoxic drugs and radioisotopes
- Inventory control, medication monitoring, drug information and data storage
- Hospital and retail pharmacy establishments.

4.7. Clinical Pharmacy and Taking Medication History Introduction

- Clinical pharmacy practice
- Elements of pharmaceutical care
- Demographic information, dietary information
- Social habits, current and past prescription medications

- Current and past non-prescription
- Medication allergies and Adverse Drug Reaction

4.8. Review of Common Laboratory and Diagnostic tests

- Liver function test and kidney function test with specific reference to normal value

4.9. Drug Interactions and Adverse drug reaction

- Drug interactions, Mechanism of drug interaction with examples
- Drug-food interaction with examples
- Adverse drug reactions, Type of ADR
- ADR monitoring and pharmacovigilance,
- Drug induced diseases and teratogenicity.

4.10. Responding to Symptoms

- Common daily terminology used in the practice of medicine,

4.11. Therapeutic Drug Monitoring

- Disease, manifestations and pathophysiology, salient symptoms to understand the disease (Tuberculosis, Hepatitis, Rheumatoid Arthritis, Cardio-vascular diseases, Epilepsy, Diabetes, Peptic Ulcer, Hypertension, COPD, Asthma, Gout, Thyroid Disease, Psoriasis, motion sickness, headache, muscular skeletal problems, women's health)

4.12. Therapeutic Drug Monitoring

- Therapeutic Drug Monitoring, Techniques of monitoring, narrow therapeutic index and its range.

4.13. Drugs used in Special population

- Pregnancy
- Lactation
- Pediatrics
- Geriatrics
- Hepatic and Renal diseases

5. Health Education & Health Care System

5.1. Health education, learning, method and media

- Concept of Health, Principles and scope of health education
- Learning, Health education methods, Health education media

5.2. Primary Health Care and health care delivery system in Nepal

- Primary Health Care, Alma-ata Declaration
- Concept, principles, element of Primary Health Care
- Implementation of PHC (in terms of WHO and government of Nepal),
- Role of pharmacist in PHC
- History of health care delivery system in Nepal
    - *Traditional health care:* Without system (Dhami, Jhankri, Lama, Guvaju etc.), With system (Ayurvedic, Homeopathy, Unani, Acupuncture/naturopathy),

5.3. Family Planning and Maternal and Child Health Care.

5.4. First Aid

- Diagnosis and treatment.:
    - Emergency / General treatment of poisoning, shock, snakebite, burns, fractures, drowning, Abdominal Pain, Cough and breathing problems, Diarrhea and vomiting, Fever, Minor skin problems, Musculo-skeletal problem, Nutritional deficiency, Minor eye, ear, nose problem.

6. Pharmacognosy

6.1. Introduction to Pharmacognosy

- History, scope and importance of Pharmacognosy,

- Classification of crude drugs,
- Complementary and alternative system of medicine and its different dosage forms (focusing on Ayurveda, Homeopathy, Siddha and Unani systems of medicine).

6.2. Plants to crude drugs

- Method of cultivation, Collection, drying and storage of crude drugs

6.3. Introduction to parts of plants

- Cell and its organelles
- Cell inclusion (ergastic cell contents)
- Plant tissues
- Microscopy and morphology of plants (leaves, root, stem, flower, fruits, seed, bark and rhizome.)

6.4. Quality control and evaluation of crude drugs

- Drug adulteration,
- World Health Organization (WHO) guidelines for the quality assessment of crude drugs
- Evaluation methods (macroscopical, microscopic, physical, chemical and biological)
- Principles and types of chromatographic techniques (Thin layer chromatography and paper chromatography)
- Microscopical Techniques of analysis

6.5. Phytochemistry

- General properties, method of extraction, classification, chemical tests and uses of the following phytoconstituents (Alkaloids, Glycosides, Volatile oil, Tannin and Resin)

6.6. Pharmacogenetic study of crude drugs

- Different phytochemical constituents containing plants with reference to biological source
- Geographical distribution, macroscopical characters, microscopical characters, chemical constituents and uses: (*Alkaloids*: Stramonium, Belladonna, Rauwolfia, Vinca, Ergot, Ipecacuanhua, Ephedra, Vasaka, Berberis *Glycosides:* Digitalis, Senna, Rhubarb, Glycyrrhiza, Dioscorea, Podophyllum, Sapindus, Chiraita, Neem *Volatile oil:* Fennel, Lemon grass, Clove, Cinnamon, Eucalyptus, Ajwain, Mentha, Cardamom, Nardostachys, Gaultheria, Ginger, Acorus, Valeriana *Resin:* Cannabis, Picrorhiza)

6.7. Pharmaceuticals Aids (focusing on source, properties, and uses)

- Starch, Gum Acacia, Tragacanth, Agar, Cod liver oil, Gelatin, Beeswax, Honey, Liquid paraffin

6.8. Status of medicinal plants of Nepal

- Vernacular name, English name, botanical name, family, distribution, habitat, parts used, morphological characteristics and uses of following medicinal plants of economic importance found in Nepal.
- Panchaunle (Dactylorhizahatagirea)
- Sugandhakokila (Cinnamomumglaucescens)
- Yarshagumba (Cordycepsinensis)
- Harro (Terminalia chebula)
- Pipla (Piper longum)
- Barro (Terminalia balerica)
- Satawari(Asparagus racemosus)
- Timur (Zantoxylumarmatum)
- Gurjo (Tinosporasinensis)
- Amala (Emblica officinalis)
- Taxus (Taxuswallichina)

7. Pharmaceutical Analysis

- Fundamental titrimetric analysis, acid-base titration.
- Basic principle of spectroscopic methods of analysis, Visible and ultra-violet spectroscopy.
- Separation techniques, Column, Paper, Thin layer chromatography
- Principles of microbiological assay of antibiotics and vitamins.
- Sampling technique and use of statistics.

8. Pharmacology & Therapeutics

8.1. General pharmacological principles

- Terminologies used in pharmacology
- Drug nomenclature, Routes of drug administration,
- Pharmacokinetics (Definition; process of absorption, distribution, biotransformation, elimination; factors affecting on these processes),
- Pharmacodynamics, Mechanism and principle of drug action, Receptor theory of Drug Action, Half-life, plasma concentration of drug and bioavailability,
- Types of adverse drug reactions

8.2. Gastrointestinal Drugs

- Management of Peptic ulcer, vomiting, diarrhea, and constipation
- General mechanism of action, use, side effect, contraindication, precaution and dose of commonly used (antacids, ulcer healing drugs, ulcer protective an anti H.pylori drugs *Antiemetic Drugs:* Metoclopramide, Domperidone, Ondansetron, promethazine, antidiarrheal: Diphenoxylate, ORS ,drug used in constipation: Bulk forming laxatives, irritant Laxative, Stool softeners, Lactulose)

8.3. NSAIDs and Antipyretic Analgesics

- Pain, pyrexia and inflammation,
- General mechanism of action, use, side effect, contraindication, precaution and dose of commonly used
- Analgesic, antipyretic and anti-inflammatory drugs: ibuprofen, indomethacin, diclofenac, nimesulide, paracetamol, aspirin
- Drugs used in rheumatoid arthritis: nsaids, disease modifying agents: steroids, methotrexate, azothioprine
- Drug used in gout: colchicine, allopurinol, febuxostat

8.4. Drugs acting on Autonomic Nervous System

- General mechanism of action, use, side effect, contraindication, precaution and dose of commonly used
- Cholinergic drugs: Pilocarpine, Neostigmine, Pyridostigmine
- Anticholinergic drugs: Atropine, Dicyclomine, Trihexyphenidyl
- Adrenergic drugs: Adrenaline, Noradrenaline, Dopamine
- Antiadrenergic drugs: Prazosin, Terazosin, Tamsulosin, Propranolol, Atenolol, Timolol

8.5. Respiratory System Drugs

- Cough, asthma and COPD
- General mechanism of action, use, side effect, contraindication, precaution and dose of commonly used
- Drugs used in cough: Anti-tussive (Codeine, Dextromethorphan) Expectorant: (Ammonium Chloride, Bromhexine, Guaifenesin)
- Drugs used in asthma and COPD: Bronchodilators: Salbutamol, salmeterol, Theophylline-Aminophylline

8.6. Antimicrobial Drugs

- Classification of antimicrobials according to their mechanism of action, spectrum of activity, types of action, type of organism
- General principles of antimicrobial therapy, microbial resistance, mechanism and types,
- General mechanism of action, use, side effect, contraindication, precaution and dose of commonly used
- Sulphonamides: Co-trimoxazole, Sulphasalazine, Sulphacetamide, Silver sulfadiazine
- Penicillin (including new generation penicillin e.g., meropenems, carbapenems and monobactams): Benzylpenicillin, Phenoxy methyl penicillin, Ampicillin, Cloxacillin, Amoxycillin
- Cephalosporin: Cephalexin, Cefaclor, Cefotaxime, Cefuroxime
- Beta lactam inhibitors and their combination: clavulanic acid, sulbactam
- Tetracycline: Tetracycline, Doxycycline
- Aminoglycosides: Streptomycin, Gentamycin, Kanamycin, Amikacin
- Macrolides: Erythromycin, Azithromycin, Clarithromycin
- Quinolones and fluoroquinolones: Norfloxacin, Ciprofloxacin, Ofloxacin, Nitrofurantoin, Levofloxacin
- Antitubercular drugs: First line: INH, Rifampicin, Pyrazinamide, Ethambutol 2 nd line: PAS, Cycloserine, Ciprofloxacin
- Antileprotic drugs: Dapsone, clofazimine
- Antifungal: Nystatin, Griseofulvin, Clotrimazole, Ketoconazole, Fluconazole
- Antiviral: Amantadine, Antiretroviral drugs
- Antimalarial: chloroquine, primaquine, mefloquine, quinine, artemisin
- Antiprotozoal: Metronidazole, Diloxanide Furoate, Tinidazole
- Anti-helminthics: Albendazole, Mebendazole, Pyrantel pamoate, Niclosamide, Praziquintel, Diethylcarbamazine citrate

8.7. Drug acting in Cardiovascular system

- Hypertension, Angina, Congestive cardiac Failure, Arrhythmia, Coagulation, Hyperlipidemia, Myocardial infarction
- Classifications, General mechanism of action, use, side effect, contraindication, precaution and dose of commonly used
    - Diuretics and anti-diuretics: Frusemide, Hydrochlorothiazide, Spironolactone, Mannitol Acetazolamide
    - Beta Blockers: Atenolol
    - Calcium channel Blockers: Amlodipine, Verapamil, Nifedipine
    - ACE inhibitors: Enalapril, Ramipril
    - ACE-II inhibitors: Losartan, Telmisartan
    - Cardiac glycosides: Digoxin
    - Lipid lowering: Atorvastatin, Simvastatin, Clofibrate, Fenofibrate
    - Anti-platelet: Aspirin
    - Anticoagulant: Heparin, Warfarin, Enoxaparin

8.8. Histamine and antihistamine

- Classifications, General mechanism of action, use, side effect, contraindication, precaution and dose of commonly used
    - Antihistamines: Chlorpheniramine, Pheniramine, Cetirizine, Levocetirizine, Fexofenadine, Loratadine, Promethazine
    - Decongestants: Local: Oxymetazoline, Xylometazoline, Nafazoline Systemic: Phenylephrine, Pseudoephedrine

8.9. Hormones and related drugs

- Classifications, General pharmacological actions, mechanism of action, use, side effect, contraindication, precaution and dose of commonly used

- Drugs used in hypothyroidism and hyperthyroidism: Thyroxine, Propylthiouracil, carbimazole
- Anti-diabetic drugs: Insulin, Glimepiride, Metformin, Sitagliptin, Pioglitazone, Glipizide, Glipalamide, glucagon
- Corticosteroids: Betamethasone, Dexamethasone, Hydrocortisone
- Gonadal hormones and their antagonist: Testesterone, Progesteron, Estrogen, Tamoxifen, Clomiphene citrate and oxytocin

8.10. Drugs acting on peripheral nervous system

- Classifications, General pharmacological actions, mechanism of action, use, side effect, contraindication, precaution and dose of commonly used
  - Skeletal muscle relaxant drugs: Suxamethonium, Tizanidine. d-tubocurarine (Curare drugs)
  - local anaesthetics: Lignocaine, Procaine, Oxythiazine

8.11. Drugs acting on central nervous system

- Classifications, General pharmacological actions, mechanism of action, use, side effect, contraindication, precaution and dose of commonly used
  - General anaesthetics: Nitrous, Oxide, Halothane, Ketamine, Propofol
  - Sedative, hypnotics: Diazepam, Alprazolam, Zolpidem, Phenobarbitone, Chlordiazepoxide
  - Antiepileptic drugs: Carbamazepine, Phenytoin, Valproic Acid
  - antiparkinsonian drugs: Levodopa, Carbidopa
  - Opioid analgesics and antagonists: Morphine, Pethidine, codeine, Naltrexone, Naloxone
  - Antipsychotic, antianxiety, antimanic and antidepressant drugs: Fluoxetine, Amitriptyline, Chlorpromazine, Haloperidol, lithium salts
  - Pharmacological actions and guidelines for safe drinking of ethyl and methyl alcohol
  - Management of migraine headache: Ergometrine

8.12. Chemotherapy and neoplastic drugs

- Mechanism of action, use, side effect, contraindication, precaution and dose of commonly used
- Anticancer drugs (Cyclophosphamide, Methotrexate, Doxorubicin, Bleomycin, Taxol, Vincristine, Cytarabine, and Cisplatin)
- Classifications, mechanism of action, use, side effect, contraindication, precaution and dose of commonly used immunosuppressant

8.13. Drugs acting on skin and mucous membrane

- Definition and Uses of (Demulcents, Emollients, adsorbents, astringents, irritants and counter irritants, keratolytics, antiseborrheics, antipsoriasis, drugs for acne vulgaris, antiseptic
- Disinfectant with their classification and spectrum of activity, drugs scabies and pediculosis, single versus combination therapy for management of skin disease

8.14. Nutritional supplement

- Classification, sources and roles of commonly used vitamins: Water soluble and fat-soluble vitamins
- Sources and therapy of iron and common minerals in the body, management of anemia

8.15. Different types of Eyes, ear and nasal preparation, Toxicology on organophosphorus Paracetamol, Barbiturates and opioid poisoning

8.16. Life Saving and Emergency Drugs

- Classification emergency Drugs used in Anaphylactic shock,
- Drugs used in Myocardial infarction and cardiogenic shock,
- Drugs used in peripheral circulatory collapse,
- Drugs used in status Epilepticus,

- Medicines for Hypertensive Crisis, Anti-snake venom for snake bite

9. Biochemistry and Microbiology

9.1. Introduction to biochemistry and its importance.

- Structure, composition, classification and multiplication of cell.
- Definition, Classification, Importance and Basic metabolism of the followings (Carbohydrates, Glycolysis, Gluconeogenesis, Citric acid cycle)
- Amino acids, Peptides and Proteins Transamination, Deamination, Urea cycle
- Lipids and fatty acids, Beta-oxidation of palmitic acid,
- Interpret the relation of Carbohydrate, Fat and protein metabolism,
- Vitamins: Definition, Classification and Clinical significance, Enzymes; Definition, Classification, Coenzymes, Isoenzymes, Clinical enzymology, Role of Minerals, ions and water in life processes.

9.2. Fundamental of Immunology

- Immune system and type of Immunity, Sources and properties of antigens, vaccines and sera Anti-bodies, T and B-lymphocytes, T-cell

9.3. Basic concepts of nucleic acid and recombinant DNA technology

- DNA, RNA, DNA replication, Introduction to pharmaceutical recombinant products

9.4. Microbiology

- Introduction to Pharmaceutical Microbiology, historical development of microbiology
- Application of microbiology with special reference to pharmaceutical sciences.

9.5. Microorganisms

- Bacteria: General morphology, Classification of Bacteria. Growth curve, growth factors, Nutrition, Requirements and factors affecting growth. Culture Media, Bacterial cultures and staining methods, Bacterial resistance to antibacterial therapy
- Viruses: General introduction and Classification FUNGI/YEAST/MOLDS: Types, morphology, pharmaceutical importance of fungi and yeasts
- Normal Flora: Normal flora of skin, Intestinal tract, ear, nose.
- Control of Microbes: Different method of sterilization and disinfections-
  - Aseptic techniques
  - Sterility Testing,
  - Sterilization of pharmaceutical ingredients and dosage forms.
  - Environmental monitoring, microbial assay of antibiotics and vitamins-method.

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