of powders, uses and packaging of powders, granules, effervescent granulated salts. Hard gelatin capsules: Capsule sizes, preparation of filled hard gelatin capsules. Soft gelatin capsules: Preparation and its application. Tablets, their types, characteristics and methods of preparation.

12. **INTRODUCTION TO PARENTERALS:** Official types of injections, solvents and vehicles for injections, added substances.

13. **A BRIEF INTRODUCTION TO ORAL HYGIENE PRODUCTS:**

PHARMACEUTICS-II (Dosage Forms Science) (Practical)

Paper 7 **Marks 100**

NOTE: Practicals of the subject shall be designed from time to time on the basis of the above mentioned theoretical topics and availability of the facilities, e.g. Prepartion of simple syrup, Orange syrup, Ferrous sulphate syrup, Cod Liver oil Emulsion, Liquid paraffin Emulsion, Throat paint (Mandle's paint), Boroglycerine glycerite, Tannic acid glycerin, Spirit ammonia aromatic, Spirit of Ethyl Nitrite. Preparation of Methyl salicylate ointment, Sulphur ointment, Calamine lotion, Iodine tincture, Preparations of oral hygiene products, Poultice of Kaolin, Effervescent granules, Distilled Water for injections (A minimum of 20 practicals will be conducted).

PHARMACOLOGY AND THERAPEUTICS-I (Theory)

Paper 2 **Marks 100**

1. **GENERAL PHARMACOLOGY:**

   a. Pharmacology: Definition, History, and its various branches. Drug: Definition and its various sources.
   b. Routes of drugs administration, advantages and disadvantages.
   c. Pharmacokinetics: Drug solubility and passage of drug across the biological membranes. Absorption, distribution, metabolism and elimination of drugs and factors affecting them. Various pharmacokinetic parameters including volume of distribution (V_d), clearance (Cl), Biological half life ($t_{1/2}\beta$), Bioavailability and various factors affecting it. Dose, Efficacy and potency of drugs. Hypersensitivity and Idiosyncratic reactions, drug tolerance and dependence. Drug interactions. Plasma protein binding.
   d. Pharmacodynamics: How drugs act? Receptors and their various types with special reference to their molecular structures. Cell surface receptors, signal transduction by cell surface receptors, signaling Mediated by intra cellular receptors, target cell and hyper sensitization, Pharmacological effects not Mediated by receptors (for example anesthetics and cathartics) Ion channel, enzymes, carrier proteins, Drug receptor interactions and theories of drug action. Agonist, antagonist, partial agonist, inverse agonist. Receptors internalization and receptors co-localization. Physiological Antagonism, Pharmacological Antagonism (competitive and noncompetitive), Neutralization Antagonism, Neurotransmission and neuro-modulation. Specificity of

drug action and factors modifying the action & dosage of drugs. Median lethal dose (LD:50), Median effective dose (ED:50) and Therapeutic Index, Dose-response relationships.

2. **DRUGS ACTING ON AUTONOMIC NERVOUS SYSTEM (ANS):**
   a. Organization of ANS its subdivisions and innervations.
   b. Neurotransmitters in ANS, their synthesis, release and fate.
   c. Sympathetic agonist drugs: Catecholamines and Non-catecholamines.
   d. Sympathetic antagonist drugs: Adrenergic receptor Blockers and neuron blockers.
   e. Parasympathetic (Cholinergic) agonists and Anticholinestrase inhibitors. Parasympathetic antagonists.
   f. Ganglion stimulants and Ganglion blockers
   g. Neuromuscular Blockers

3. **DRUGS ACTING ON GASTROINTESTINAL TRACT**:
   a. Emetic and anti-emetics.
   b. Purgatives.
   c. Anti-diarrheal agents.
   d. Treatment of Peptic ulcer: Antacids, H_2-Receptor antagonists, antimuscarinic agents, proton pump inhibitors, prostaglandin agonists, gastrin receptor antagonist and cytoprotective agents.
   e. Drug treatment of chronic inflammatory bowel diseases.
   f. Drugs affecting bile flow and Cholelithiasis.

4. **AUTACOIDS AND THEIR ANTAGONISTS:** Histamine and Anti-histamines, Serotonin and Serotonin Antagonists, Prostaglandins and their antagonists.

5. **DRUGS ACTING ON RESPIRATORY SYSTEM:**
   a. Drugs used for cough (Anti-tussives, Expectorants and Mucolytic Agents).
   b. Drugs used for Bronchial Asthma (Bronchodilators, Cromoglycate, Nedocromil, Cortecosteroids & other Anti-inflammatory drugs and Muscarinic receptor antagonists. Cromoglycate, Nedocromil, Cortecosteroids & other Anti-inflammatory drugs.

6. **DRUGS ACTING ON CARDIO-VESCULAR SYSTEM:**
   a. Angina pectoris and its drug treatment
   b. Congestive heart failure & its treatment
   c. Anti-arrhythmic drugs
   d. Anti-hyperlipidemia
   e. Coagulants and Anti-coagulants
   f. Anti-hypertensives
   g. Diuretics

7. **DRUGS ACTING ON GENITO-URINARY SYSTEM:** Oxytoxic drugs, Ergot alkaloids and uterine relaxants.

8. **ANTI-ANAEMIC DRUGS:**

9. **HORMONES, ANTAGONISTS AND OTHER AGENTS AFFECTING ENDOCRINE FUNCTION:** Endocrine function and dysfunctions. Drug used for therapy of Diabetes Mellitus: Insulin and Oral Hypoglycemic agents, Corticosteroids, Thyroid hormone and anti-thyroid drugs.

NOTE:

1. Only an introduction will be given of the banned and obsolete drug products.
2. While dealing with Pharmacology stress should be laid to the group actions of related drugs and only important differences should be discussed of the individual drugs placed in same group.
3. Newly introduced drugs should be included in the syllabus while drugs with no clinical and therapeutic values ought to be excluded from syllabus at any time.
4. The prototype drugs in each group from the latest edition of the recommended books.

PHARMACOLOGY AND THERAPEUTICS-I (Practical)

Paper 8 **Marks 100**

NOTE: Practical of the subject shall be designed from time to time on the basis of the above mentioned theoretical topics and availability of the facilities e.g.

- Introduction to instruments: such as Organ Bath, Kymograph, Oscilograph polygraph Patch Clamp Technique and Power Lab.
- Preparation of standard solution: Ringer solution. Tyrode solution. Kreb solution. Normal saline solution. To demonstrate the effects of sympathomimetic (Adrenaline) & sympatholytic drugs (Propranolol) on Frog's heart.
- To demonstrate the effects of parasympathomimetic (Acetylcholine) and parasympatholytic (Atropine) drugs on Frog's heart.
- To demonstrate the effects of an unknown drug on Frog's heart. Routes of Administration of drugs.
- To demonstrate the effects of vasconstrictor drugs on Frog's blood vessels. To demonstrate the effects of stimulant drugs on Rabbit's intestine (Acetyl choline, Barium chloride).
- To demonstrate the effects of depressant drugs on Rabbit's intestine (Atropine). To differentiate the effects of an unknown drug on Rabbit's intestine and identify the (unknown) drug.
- To study the effects of Adrenaline on Rabbit's Eyes.
- To study the effects of Homatropine on Rabbit's Eyes.
- To study the effects of Pilocarpine on Rabbit's Eyes.
- To study the effects of Local Anaesthetic drug (e.g Cocaine) on Rabbit's Eyes.
- To identify the unknown drug & differentiate its effects on Rabbit's Eyes.
- To demonstrate emetic effects of various drugs in pigeons.

(Note: A minimum of 20 practicals will be conducted).