1.1 PHARMACEUTICS-I

1. Introduction of different dosage forms. Their classification with examples-their relative applications. Familiarisation with new drug delivery systems.

2. Introduction to Pharmacopoeias with special reference to the Indian Pharmacopoeia.


4. Packing of Pharmaceuticals-Desirable features of a container-types of containers. Study of glass and plastics as materials for containers and rubber as material for closures-their merits and demerits. Introduction to aerosol packaging.


8. Clarification and Filtration-Theory of filtration, Filter media; Filter aids and selection of filters. Study of the following filtration equipments-Filter Press, Sintered Filters, Filter Candles, Metafilter

9. Extraction and Galenicals-(a) Study of percolation and maceration and their modification, continuous hot extraction-Applications in the preparation of tinctures and extracts.

(b) Introduction to Ayurvedic dosage forms.

11. Distillation-Simple distillation and Fractional distillation; Steam distillation and vacuum distillation. Study of vacuum still, preparation of Purified Water I.P. and water for injection I.P. Construction and working of the still used for the same.


   (i) Sterilization with moist heat,

   (ii) Dry heat sterilization,

   (iii) Sterilization by radiation,

   (iv) Sterilization by filtration and

   (v) Gaseous sterilization.

Aseptic techniques. Application of sterilization processes in hospitals particularly with reference to surgical dressings and intravenous fluids. Precautions for safe and effective handling of sterilization equipment.

14. Processing of Tablets-Definition; Different types of compressed tablets and their properties. Processes involved in the production of tablets; Tablets excipients; Defects in tablets. Evaluation of Tablets; Physical Standards including Disintegration and Dissolution. Tablet coating-sugar coating; film coating, enteric coating and microencapsulation (Tablet coating may be dealt in an elementary manner.)

15. Processing of Capsules-Hard and soft gelatin capsules; different sizes capsules; filling of capsules; handling and storage of capsules, Special applications of capsules.

16. Study of immunological products like sera vaccines, toxoids & their preparations.
PRACTICAL (100 hours)
Preparation (minimum number stated against each) of the following categories illustrating different techniques involved.

1. Aromatic waters
2. Solutions
3. Spirits
4. Tinctures
5. Extracts
6. Creams
7. Cosmetic preparations
8. Capsules
9. Tablets
10. Preparations involving sterilization
11. Ophthalmic preparations
12. Preparations involving aseptic techniques

Books Recommended : (Latest editions)


2. The Extra Pharmacopoeia-Martindale.
1.2 PHARMACEUTICAL CHEMISTRY –I

1. General discussion on the following inorganic compounds including important physical and chemical properties, medicinal and Pharmaceutical uses, storage conditions and chemical incompatibility.

(A) Acids, bases and buffers Boric acid*, Hydrochloric acid, strong ammonium hydroxide, Calcium hydroxide, Sodium hydroxide and official buffers.

(B) Antioxidants-Hypophosphorous acid, Sulphur dioxide, Sodium bisulphite, Sodium metabisulphite, Sodium thiosulphate, Nitrogen and Sodium Nitrite.

(C) Gastrointestinal agents--

(i) Acidifying agents Dilute hydrochloric acid.

(ii) Antacids-Sodium bicarbonate, Aluminium hydroxide gel, Aluminium Phosphate, Calcium carbonate, Magnesium carbonate, Magnesium trisilicate, Magnesium oxide, Combinations of antacid preparations.

(iii) Protectives and Adsorbents-Bismuth subcarbonate and Kaolin.

(iv) Saline Cathartics-Sodium potassium tartrate and Magnesium sulphate.

(D) Topical Agents-

(i) Protectives-Talc, Zinc Oxide, Calamine, Zinc stearate, Titanium dioxide, Silicone polymers.


(iii) Sulphur and its compounds-Sublimed sulphur precipitated sulphur, selenium sulphide.

(iv) Astringents:-Alum and Zinc Sulphate.
(E) Dental Products-Sodium Fluoride, Stannous Fluoride, Calcium carbonate, Sodium metaphosphate, Dicalcium phosphate, Strontium chloride, Zinc chloride.

(F) Inhalants-Oxygen, Carbon dioxide, Nitrous oxide.

(G) Respiratory stimulants-Ammonium Carbonate.


(I) Antidotes-Sodium nitrate.

2. Major Intra and Extracellular electrolytes-

(A) Electrolytes used for replacement therapy-Sodium chloride and its preparations, Potassium chloride and its preparations.

(B) Physiological acid-base balance and electrolytes used-Sodium acetate, Potassium acetate, Sodium bicarbonate injection, Sodium citrate, Potassium citrate, Sodium lactate injection, Ammonium chloride and its injection.

(C) Combination of oral electrolyte powders and solutions.

3. Inorganic Official compounds of Iron, Iodine, and, Calcium Ferrous Sulfate and Calcium gluconate.


Radio opaque Contrast media-Barium sulfate.

5. Quality control of Drugs and Pharmaceuticals-Importance of quality control, significant errors, methods used for quality control, sources of impurities in Pharmaceuticals, Limit tests for Arsenic, chloride, sulphate, Iron and Heavy metals.

6. Identification tests for cations and anions as per Indian Pharmacopoeia.
PRACTICAL (75 hours)

1. Identification tests for inorganic compounds particularly drugs and pharmaceuticals.

2. Limit test for chloride, sulfate, Arsenic, Iron and Heavy metals.

3. Assay of inorganic Pharmaceuticals involving each of the following methods of compounds marked with (*) under theory.
   
a. Acid-Base titrations (at least 3)

b. Redox titrations (One each of Permanganometry and iodimetry)

c. Precipitation titrations (at least 2)

d. Complexometric titrations (Calcium and Magnesium)

Book recommended (Latest editions)

Indian Pharmacopoeia.
1.3 PHARMACOGNOSY

1. Definition, history and scope of Pharmacognosy including indigenous system of medicine.

2. Various systems of classification of drugs of natural origin.

3. Adulteration and drug evaluation; significance of Pharmacopoeial standards.

4. Brief outline of occurrence, distribution, outline of isolation, identification tests, therapeutic effects and pharmaceutical applications of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins.

5. Occurrence, distribution, organoleptic evaluation, chemical constituents including tests wherever applicable and therapeutic efficacy of following categories of drugs.

(a) Laxatives: Aloes, Rhubarb, Castor oil, Ispaghula, Senna.

(b) Cardiotonics-Digitalis, Arjuna.

(c) Carminatives & G.I. regulators-Umbelliferous fruits, Coriander, Fennel, Ajowan, Cardamom Ginger, Black pepper, Asafoetida, Nutmeg, Cinnamon, Clove.

(d) Astringents-Catechu.

(e) Drugs acting on nervous system-Hyoscyamus, Belladonna, Aconite, Ashwagandha, Ephedra, Opium, Cannabis, Nux vomica.

(f) Antihypertensives-Rauwolfia.

(g) Antitussives-Vasaka, Tolu balsam, Tulsi.

(h) Antirheumatics-Guggul, Colchicum.

(i) Antitumour-Vinca.

(j) Antileprotics-Chaulmoogra Oil.

(k) Antidiabetics -Pterocarpus, Gymnema, Sylvestro.
(l) Diuretics-Gokhru, Punarnava.

(m) Antidysentrics-Ipecacuanha

(n) Antiseptics and disinfectants Benzoin, Myrrh. Nim, curcuma.

(o) Antimalarial-Cinchona.

(p) Oxytocics-Ergot.

(q) Vitamines-Shark liver Oil and Amla.

(r) Enzymes-Papaya, Diastase, Yeast.

(s) Perfumes and flavouring agents-Peppermint Oil, Lemon Oil, Orange Oil, Lemon grass Oil, Sandalwood.

(t) Pharmaceutical aids-Honey, Arachis Oil, Starch, Kaolin, Pectin, Olive oil, Lanolin, Beeswax, Acacia, Tragacanth, Sodium alginate, Agar, Guar gum, Gelatin.

(u) Miscellaneous-Liquorice, Garlic, Picrorhiza, Dioscorea, Linseed, Shatavari, Shankhpushpi, Pyrethrum, Tobacco.

6. Collection and preparation of crude drug for the market as exemplified by Ergot, opium, Rauwolfia, Digitalis, Senna.

7. Study of source, preparation and identification of fibres used in sutures and surgical dressings-cotton, silk, wool and regenerated fibre.

8. Gross anatomical studies of Senna, Datura, Cinnamon, Cinchona, Fennel, Clove, Ginger, Nux vomica & Ipecacuanha.

PRACTICAL  

(75 hours)

1. Identification of drug by morphological characters.

2. Physical and chemical tests for evaluation of drugs wherever applicable.

3. Gross anatomical studies (t.s) of the following drugs: Senna, Datura, Cinnamon, Cinchona, Coriander, Fennel, Clove, Ginger, Nux vomica, Ipecacuanha.

4. Identification of fibres and surgical dressings.
1.4 BIOCHEMISTRY AND CLINICAL PATHOLOGY

Theory (50 hours)

1. Introduction to biochemistry.

2. Brief chemistry and role of proteins, polypeptides and amino acids, classification, Qualitative tests, Biological value, Deficiency diseases.

3. Brief chemistry and role of Carbohydrates, Classification, qualitative tests, Diseases related to carbohydrate metabolism.

4. Brief chemistry and role of Lipids, Classification, qualitative tests. Diseases related to lipids metabolism.

5. Brief chemistry and role of Vitamins and Coenzymes.

6. Role of minerals and water in life processes.


9. Introduction to pathology of blood and urine.

(a) Lymphocytes and Platelets, their role in health and disease.

(b) Erythrocytes Abnormal cells and their significance.

(c) Abnormal constituents of urine and their significance in diseases.

PRACTICAL (75 hours)


2. Analysis of normal and abnormal constituents of Blood and Urine (Glucose, Urea, Creatine, creatinine, cholesterol, alkaline phosphatase, acid phosphatase, Bilirubin, SGPT, SGOT, Calcium,Diastase, Lipase).

3. Examination of sputum and faeces (microscopic and staining).

4. Practice in injecting drugs by intramuscular, subcutaneous and intravenous routes. Withdrawal of blood samples.
1. Scope of Anatomy and Physiology. Definition of various terms used in Anatomy

2. Structure of cell, function of its components with special reference to mitochondria and microsomes.

3. Elementary tissues of the body. i.e epithelial tissue, muscular tissue, connective tissue and nervous tissue.


6. Name and functions of lymph glands.


8. Various parts of respiratory system and their functions. Physiology of respiration.


10. Structure of skeletal muscle. Physiology of muscle contraction, Names, position, attachments and functions of various skeletal muscles. Physiology of neuromuscular junction.

11. Various parts of central nervous system, brain and its parts, functions and reflex action. Anatomy and Physiology of autonomic nervous system.

12. Elementary knowledge of structure and functions of the organs of taste, smell, ear, eye and skin. Physiology of pain.

13. Digestive system; names of the various parts of digestive system and their functions. Structure and functions of liver, physiology of digestion and absorption.


15. Reproductive system - Physiology and Anatomy of Reproductive system.
PRACTICAL (50 hours)

1. Study of the human skeleton.

2. Study with the help of charts and models of the following systems and organs:
   (a) Digestive system.
   (b) Respiratory system.
   (c) Cardiovascular system.
   (d) Urinary system.
   (e) Reproductive system.
   (f) Nervous system.
   (g) Eye.
   (h) Ear.

3. Microscopic examination of epithelial tissue, cardiac muscle, smooth muscle, skeletal muscle. Connective tissue and nervous tissues.

4. Examination of blood films for TLC, DLC and malarial parasite.

5. Determination of clotting time of blood, erythrocyte sedimentation rate and Hemoglobin value.

6. Recording of body temperature, pulse, heart rate, blood pressure and ECG.
1.6 HEALTH EDUCATION AND COMMUNITY PHARMACY

1. Concept of health -Definition of physical health, mental health, social health, spiritual health
determinants of health, indicators of health, concept of disease, natural history of diseases, the
disease agents, concept of prevention of diseases.
2. Nutrition and health-Classification of foods requirements, disease induced due to deficiency of
proteins, Vitamins and minerals-treatment and prevention.
3. Demography and family planning-Demography cycle, fertility, family planning, contraceptive
methods, behavioural methods, natural family planning method, chemical method, mechanical
methods, hormonal contraceptives, population problem of India.
4. First aid-Emergency treatment in shock, snake-bite, burns poisoning, heart disease, fractures
and resuscitation methods. Elements of minor surgery and dressings.
5. Environment and health-Sources of water supply, water pollution, purification of water, health
and air, noise light-solid waste disposal and control-medical entomology, arthropod borne
diseases and their control, rodents, animals and diseases.
6. Fundamental principles of microbiology classification of microbes, isolation, staining
techniques of organisms of common diseases.
7. Communicable diseases -Causative agents, modes of transmission and prevention.
   (a) Respiratory infections-Chicken pox, measles. Influenza, diphtheria, whooping cough and
tuberculosis.
   (b) Intestinal infections: Poliomyelitis. Hepatitis. Cholera. Typhoid. Food poisoning,
Hookworm infection.
   (c) Arthropod borne infections-plague, Malaria, Filariasis.
   (d) Surface infections-Rabies, Trachoma, Tetanus, Leprosy.
   (e) Sexually transmitted diseases ---Syphilis. Gonorrhoea. AIDS.
8. Non-communicable diseases-Causative agents, prevention, care and control; Cancer, Diabetes,
Blindness, Cardiovascular diseases.
9. Epidemiology- Its scope, methods, uses, dynamics of disease transmission, immunity and
immunization: Immunological products and their dose schedule. Principles of disease control and
prevention, hospital acquired infection, prevention and control. Disinfection, types of
disinfection, disinfection procedures, for faeces, urine, sputum, room linen, dead-bodies,
instruments.