PHARMACEUTICAL CHEMISTRY -I

Theory (75 hours)

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 tartarate and Magnesium sulphate.

   D. Topical Agents-
      i. Protectives-Talc, Zinc Oxide, Calamine, Zinc stearate, Titanium dioxide, Silicone polymers.
      ii. Antimicrobials and Astringents-Hydrogen peroxide*, Potassium permanganate, Chlorinated lime, Iodine, Solutions of Iodine, Povidone-iodine, Boric acid, Borax. Silver nitrate, Mild silver protein, Mercury, Yellow mercuric oxide, Ammoniated mercury.
      iii. Sulphur and its compounds-Sublimed sulphur precipitated sulphur, selenium sulphide.
      iv. Astringents:-Alum and Zinc Sulphate.

   E. Dental Products-Sodium Fluoride, Stannous Flouride, Calcium carbonate, Sodiummetaphosphate, Dicalcium phosphate, Strontium chloride, Zinc chloride.

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

   G. Respiratory stimulants-Ammonium Carbonate.

   H. Expectorants and Emetics-Ammonium chloride, *Potassium iodide, Antimony Potassium tartarate.

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.

4. Radio pharmaceuticals and Contrast media-Radio activity-Alpha, Beta and Gamma Radiations, Biological effects of radiations, Measurement of radio activity, G. M. Counter Radio isotopes their uses, storage and precautions with special reference to the official preparations. 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.