

## BP302T. PHYSICAL PHARMACEUTICS-I(Theory)

45 Hours

### Course Content:

#### Unit-I 10 Hours

**Solubility of drugs:** Solubility expressions, mechanisms of solute solvent interactions, ideal solubility parameters, solvation & association, quantitative approach to the factors influencing solubility of drugs, diffusion principles in biological systems. Solubility of gas in liquids, solubility of liquids in liquids, (Binary solutions, ideal solutions) Raoult's law, real solutions. Partially miscible liquids, Critical solution temperature and applications. Distribution law, its limitations and applications.

#### Unit-II 10 Hours

**States of Matter and properties of matter:** State of matter, changes in the state of matter, latent heats, vapor pressure, sublimation critical point, eutectic mixtures, gases, aerosols– inhalers, relative humidity, liquid complexes, liquid crystals, glassy states, solid- crystalline, amorphous & polymorphism.

**Physicochemical properties of drug molecules:** Refractive index, optical rotation, dielectric constant, dipole moment, dissociation constant, determinations and applications.

#### Unit-III 10 Hours

**Surface and interfacial phenomenon:** Liquid interface, surface & interfacial tensions, surface free energy, measurement of surface & interfacial tensions, spreading coefficient, adsorption at liquid interfaces, surface active agents, HLB scale, solubilization, detergency, adsorption at solid interface.

#### Unit-IV 08Hours

**Complexation and protein binding:** Introduction, Classification of Complexation, Applications, methods of analysis, protein binding, Complexation and drug action, crystalline structures of complexes and thermodynamic treatment of stability constants.

#### Unit-V 07 Hours

**pH, buffers and Isotonic solutions:** Sorensen's pH scale, pH determination (electrometric and calorimetric), applications of buffers, buffer equation, buffer capacity, buffers in pharmaceutical and biological systems, buffered isotonic solutions.

## BP306P. PHYSICAL PHARMACEUTICS – I (Practical)

4 Hrs/week

1. Determination the solubility of drug at room temperature.
2. Determination of pKa value by Half Neutralization/Henderson Hasselbalch equation.
3. Determination of Partition co- efficient of benzoic acid in benzene and water.
4. Determination of Partition co- efficient of Iodine in CCl<sub>4</sub> and water.
5. Determination of % composition of NaCl in a solution using phenol-water system by CST method.
6. Determination of surface tension of given liquids by drop count and drop weight method.
7. Determination of HLB number of a surfactant by saponification method.
8. Determination of Freundlich and Langmuir constants using activated char coal.
9. Determination of critical micellar concentration of surfactants.
10. Determination of stability constant and donor acceptor ratio of PABA-Caffeine complex by solubility method.
11. Determination of stability constant and donor acceptor ratio of Cupric Glycine complex by pH titration method.

### Recommended Books: (Latest Editions)

- Physical Pharmacy by Alfred Martin, Lippincott Williams and Wilkins, USA.
- Tutorial Pharmacy by Cooper and Gunn, CBS, New Delhi.
- Pharmaceutical Calculations by Stocklosam J., Lea & Febiger, Philadelphia.
- Pharmaceutical Dosage forms: Disperse systems by Lieberman H.A, Lachman C, Volume 3, Marcel Dekker Inc.
- Physical Pharmaceutics by Ramasamy C. and Manavalan R., PharmaMed Press, Hyderabad.
- Laboratory Manual of Physical Pharmaceutics by C.V.S. Subramanyam. J., Thimma Settee.
- Experimental Pharmaceutics by Eugene, Parott, Burgess Pub. Co., UK.
- Physical Pharmaceutics by C.V.S. Subramanyam. CBS Publication
- Textbook of Physical Pharmacy by Gaurav Jain & Roop K. Khar, Reed Elsevier India Pvt. Ltd., New Delhi.
- Physical Pharmaceutics by Shotton E & Ridgeway K, Oxford University Press, London.
- Essentials of Physical Pharmacy by D.V. Derle, BSP Book Pvt. Ltd., Hyderabad.
- Pharmaceutics: The Design and Manufacture of Medicines by Aulton M.E, Churchill Livingstone.