

Ex/Pharm/ BP302T/2025

Bachelor of Pharmacy Second Year First Semester Examination, 2025

Physical Pharmaceutics I

Time: **Three hours**

Full Marks: **75**

Answer any five questions taking at least one from each group.

Group A

1. a) Define adsorption, adsorbent, adsorbate, desorption.
b) Differentiate between physical adsorption, and chemical adsorption.
c) Briefly discuss about Type I, Type II, Type III, Type IV, and Type V adsorption isotherm.
 $4+3+8=15$
2. a) Define surface active agents. How surface active agent reduces surface and interfacial tension? Classify surface active agents with example. $2+2+3=7$
b) What is HLB? Draw the diagram of HLB scale. How to calculate the HLB values of simple alkyl ethers and polyhydric alcohol fatty acid esters? $1+3+4=8$

Group B

3. Define complexation. Classify the type of complexes. Define Inner sphere and Outer sphere complexes. Give example in each case. Which instrument is used to detect them? Give the electron distribution, type of hybridization and 3-D structure of one Inner sphere complex and one Outer sphere complex. Define chelates. Write their use in pharmacy. Why copper is more poisonous in dogs than humans. $1+1+2+1+1+4+1+2+2 = 15$
4. Write the importance of drug-protein bindings. Deduce the equation of Klotz's reciprocal plot. Deduce the equation that solve the limitation of Klotz's reciprocal plot and how? Write the equation of Sandberg's equation? Write its importance. Write with an example of molecular mechanism of organo-molecular complexes? $2+4+2+1+1+1+4 = 15$

Group C

5. i. Write a solubility expression table.
ii. Explain the factors influencing the solubility of drugs.
iii. Write in detail about the diffusion principles in the Biological membrane system.
iv. Give examples of LCT, UCT, both LCT and UCT? $2+4+5+4=15$

[Turn over

6. i. Write the types of Physical properties of material?
- ii. Classify refractometer?
- iii. Write the working principles and Application of Abbe's Refractometer with a diagram.
- iv. Write definition: a. Optical rotation b. Dielectric constant. $2+2+(2+5)+4=15$

Group D

7. a) How to make 50ml of a 2% solution of procaine hydrochloride isotonic with body fluid?
[NaCl equivalent= 0.21] [5]
 - b) Discuss about the various factors influencing the pH of buffer solutions. [3]
 - c) Define buffers. What do you mean by buffer capacity? Derive the expression of maximum buffer capacity. [1+1+5]
 8. Write short notes on any 3 of the following: [5*3]
 - a) Drying by sublimation.
 - b) "Gases can be liquefied under high pressure in a closed chamber. When the pressure is reduced, the liquid reverts to gaseous state". Discuss how this property can be used in development of pharmaceutical formulations.
 - c) Importance of determination of crystal forms of API in pharmaceutical formulation development.
 - d) Physiological buffers.
-