Ex/BP302T/2024 (S)

Bachelor of Pharmacy Second Year First Semester-2024

Physical Pharmaceutics I

Time: **Three hours** Full Marks: **75**

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

Group A

1. a) Discuss the capillary rise method for the determination of surface tension. b) Explain the effect of temperature on surface tension c) When a drop of liquid is suspended in air, it assumes a spherical shape. Why? d) A soap solution having surface tension of 49.05 dyne/cm is applied to the metal frame bar of 5 cm. Calculate the work required to pull the wire down by 2 cm. 6+3+3+3=15

2. a) Explain Langmuir adsorption isotherm. Derive the equation of Langmuir adsorption isotherm. b) What is HLB number? Write HLB number scale with different properties. How to calculate the HLB values of simple alkyl ether and polyhydric alcohol fatty acid esters? c) Calculate the HLB of a mixture of 40% Span 60 and 60% of Tween 60. HLB of Span 60 = 4.7 and HLB of Tween 60=14.9. 6+(1+3+2)+3=15

Group B

3. Define buffer. What do you mean by buffer action? What do mean by buffer capacity? Derive an expression for the maximum buffer capacity. What are the various methods of adjusting tonicity and pH? (2+2+2+4+5=15)

4. Write short notes on any three of the following (5*3=15)

I) Lyophilization

II) Pharmaceutical aerosols

III) Polymorphism

IV) Hydrates and solvates

Group C

5. i. Write a solubility expression table.

ii. Explain the factors influencing the solubility of drugs.

iii. Write in details about the diffusion principles in Biological membrane system.

iv. What is CST, LCT, UCT, CMC? (2+4+5+4=15)

6. i. What is refraction molar refraction?

ii. Write the types refractometer?

iii. Write the working principles and Application of Abbe's Refractometer with diagram.

iv. Write definition: a. polarimetry b. dipole moments. (2+2+(3+3+3) +2=15)

Group D

7. Define viscosity. What are reduced viscosity and intrinsic viscosity? What is Huggins constant? Give its significance. What is Reynolds no.? Give its significance related to fluid flow. Draw an Ostwald viscometer. Describe how you will measure viscosity using it. Provide the relevant equations. 1+2+1+2+1+3+1+2+2 =15

8. What do you mean by non-Newtonian flow? Describe and differentiate plastic and dilatant flows. What is thixotropy? Give its importance. What is fluidity? Describe the measurement of viscosity using coaxial rotary drum viscometer. Give its relevant equations.

1+6+1+1+1+3+2 =15