B Pharma Second Year Second Semester Examination 2025

Physical Pharmaceutics II

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

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

Group A

Q1. i. Write the types of colloid and differentiate in between solution, colloid and suspension. ii. Classify the properties of colloid, and write in details about kinetic properties of colloid.

(4+3) + (2+6) =15

Q2. i. Short notes on (2x5=10) + (5x1=5) =15

a. CMC **b.** Protective colloid **c.** Stability of colloid **d.** Use of colloid **e.** Stokes's law

ii. Write the **dispersion medium** and **dispersed phase** of

i. pumice stone ii. Fog iii. Paint iv. Smoke v. froth

Group B

Q3. i) What is drug stability? What are the adverse effects of drug instability? ii) Define the rate and order of a reaction. What are the internal and external factors affecting the rate of a reaction? iii) Derive the expression for the rate constant and half-life period for a zero-order reaction. iv) A suspension shows zero order kinetics with a rate constant of 2 mg/ml.month. The dose of the suspension is 20 mg/ml. a) Calculate t90. The drug solubility is 0.1 mg/ml. b) What is the first order rate constant? Calculate half-life of zero order.

(1+2) + (2+2) + 4+ 4 = 15

Q4. i) Discuss the physical factors influencing the chemical degradation of pharmaceutical product.

ii) In the saponification of methylacetate at 25°C, the concentration of sodium hydroxide remaining after 75 minutes was 0.00552 M. The initial concentration of ester and the base was 0.01 molar. Calculate the second order rate constant and half-life of the reaction.

8+7 = 15

Group C

Q5. What is creep testing? Why is it done? What is called Creep compliance? If a phase lag is 90-degree in value, what does it indicates regarding the material's physical status? Describe the problem associated with the determination of single point viscosity for non-Newtonian fluids? Define Thixotropy. Give and describe the rheogram of thixotropic dilatant materials. What is the significance of Loop of hysteresis here? Describe concentric cylinder viscometer

and deduce the relevant equation to determine viscosity. What is Weissenberg effect?

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

Q6. Describe the Bingham flow with rheogram and give the viscosity equation. Give the material those give dilatant flow. Label with a neat diagram Ostwald U-tube viscometer, describe it, and deduce the equation for viscosity of fluid, using it. Write Reynolds' number and give its importance. Give Mark-Houwink equation and give its importance. What is Huggins' constant? How will you determine intrinsic viscosity? 2+1+2+3+1+2+1+1+2 =15

Group D

Q. 7. Answer any 3 of the following:

i) Why are the science of small particles so very important in the field of pharmacy and medicine?

ii) What measures may be taken to increase as well as reduce the void space of a given mass of powder?

iii) Differentiate the physico chemical nature of light & heavy varieties of any powder mass.

iv) What mechanism is involved in Coulter Counter machine, and what is the major industrial application of it?

Q. 8. Answer any 3 of the following:

i) How the yield value of visco-elastic materials may be measured, and what are its industrial applications?

ii.a) How different viscosity builders enhance viscosity of aqueous media?

ii.b) How can you maximize the viscosity of a certain percentage of cellulosic derivatives?

iii) Explain the characteristics of micro emulsions & its applications?

iv) Write short notes on physical stabilization of an emulsion and its preservation against microbial growth.

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