

Bachelor of Pharmacy Final Examination, 2022

(2<sup>nd</sup> Year-2<sup>nd</sup> Semester)

**Physical Pharmaceutics II**

Time: Three hours

Full Marks: 100

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

**Group A**

1. Why stability studies are necessary? Explain pseudo-first order reaction with example. What is first order reaction? Derive the expression for rate constant and half-life period for 1<sup>st</sup> order reaction. What are the methods available for determination of order of reaction? Discuss any one method. 4+5+1+5+1+4=20

2. a) Write Arrhenius equation and explain the terms. Give two example of drugs that undergo oxidation. Write the measures to be taken to prevent or reduce the oxidation of drugs with suitable examples.

b) The catalytic decomposition of hydrogen peroxide can be followed by measuring the volume of oxygen liberated in a gas burette. From such an experiment, it was found that the concentration of hydrogen peroxide remaining after 65 min, expressed as the volume in milliliters of gas evolved, was 9.60 from an initial concentration of 57.90.

(i) Calculate k (first order rate constant).

(ii) How much hydrogen peroxide remained undecomposed after 25 min? (4+1+7) +8=20

**Group B**

3. Why is an emulsion a thermodynamically unstable system? Discuss, with diagrams, the various mechanisms by which an emulsifying agent imparts stability to an emulsion system. Discuss on rheological considerations of an emulsion system. Write notes on HLB value of EA and their use. 5+7+

5+3=20

4. Write short notes on any 4 of the following:

4x5=20

- a) Edmundson equation
- b) Andreasen apparatus
- c) Coulter counter method
- d) Gels
- e) Hausners ratio and compressibility index.

### Group C

5. Write different types of classification of colloids and comparative account of their properties.

$$10+10=20$$

6. List down the types of properties of colloids. Write in detail about the electrical properties.

$$8+12=20$$

### Group D

7. Define viscosity. What are the units of viscosity define them. What do you mean by relative viscosity, intrinsic viscosity, viscosity number, apparent viscosity, and mobility? How will you determine viscosity using suspended level viscometer (describe the methods and calculations for determination of viscosity). What is Reynolds's number? Write its significance related to different types of fluid flow. Write a method to determine Reynolds's number.

$$2+3+5+4+1+2+3 = 20$$

8. Describe the rheograms with the relevant mathematical expressions of Plastic flow, Pseudoplastic flow and dilatant flow. How will you determine the viscosity by rotary drum method (describe with the relevant mathematical expression)? What is thixotropy? Explain it with creep compliance curve. Define loop of hysteresis and give its importance. Define Storage modulus and loss modulus.

$$8+4+2+2+2+2 = 20$$