**BPharmacy Second Year Second Semester Examination 2024**

**Physical Pharmaceutics II**

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

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

## Group A

Q1. Write the 4 types of colloid classification and Write the Application of colloid. 10+5=15

Q2. Classify the properties of colloid. Write in details about **optical** and **kinetic** properties of colloid. 5+5+5=15

Q3. Short notes on (5X3=15)

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

## Group B

Q4. (a) Define complexation. Classify it. Provide electron distribution during hybridization, 3D structure, type of hybridization of the following complexes

$[Co(NH_3)_6]^{3+}$, $[Cu(NH_3)_4]^{2+}$,

1+2+3=6

(b) Provide example the use of chelate in

(i) the analysis of drug

(ii) Protecting drug in a formulation

2+2=4

(c) Describe with example of complexation with

(i) Donor-acceptor mechanism

(ii) Charge-transfer complex 2+2+4

(d) How will you detect unpaired electron in a metal ion complex? (1)

Q5. Give the significance of drug protein binding. Describe a method to determine drug protein binding. Deduce equation of Klotz 's reciprocal plot. Write its advantages and disadvantages. Deduce the equation of Scatchard's plot. Write its advantages over Klotz's plot. 2+3+4+2+2+2= 15

## Group C

Q. 6. Answer any 3 of the following questions: 3x5=15

i) Importance of "particle size & the related surface area" in the field of pharmacy and medicine. "

ii) What measures may be taken for further improvement of flow properties of a powder-granule mix mass to compress into tablet or encapsulated into hard gelatin capsules.

iii) What are the characteristics of micro emulsions?

iv) Explain the three major theories of emulsifications.

Q. 7. Write short notes on any 3 of the following: 3x5=15

i) Preservation of an emulsion to prevent microbial growth.

ii) Mechanism involved in "Oswald ripening" related to dispersed systems & remedies to minimize it?

iii) Zeta potential & physical stability of dispersed systems.

iv) Mechanism involved in the determining micro particles' volume.

**Group D**

Q8. i) Why stability studies are necessary? 2+3+1+4+3+2=15
ii) Explain pseudo-first order reaction with example.
iii) What is first order reaction?
iv) Derive the expression for rate constant and half-life period for 1$^{st}$ order reaction.
v) The half-life of a drug that decomposes by first order is 55 days. Calculate rate constant and shelf-life.
vi) How suppression of solubility gives stabilization against hydrolysis?

Q9. i) Write about the physico-chemical factors influencing the chemical degradation of pharmaceutical product.
ii) A suspension shows zero order reaction kinetics with a rate constant of 2 mg/ml.month. The dose of the suspension is 20 mg/ml. a) Calculate $t_{90}$. The drug solubility is 0.1 mg/ml. b) What is the first order rate constant? Calculate half-life of zero order kinetics. 8+7 = 15