

B.Pharm II Year I Semester (R15) Supplementary Examinations April 2022

PHYSICAL PHARMACY – I

(For R09 & R13 readmitted to R15)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- What is latent heat?
 - Define relative humidity.
 - What is meant by optical rotation?
 - What is molar refraction?
 - Define the terms normality and molarity.
 - Mention modern theory of strong electrolytes.
 - Define buffer capacity.
 - What are hypotonic solutions and hypertonic solutions?
 - Define the terms kinetics and order of a reaction.
 - What is meant by rate of a reaction? Mention the factors influencing reaction rate.

PART – B

(Answer all the questions: 05 X 10 = 50 Marks)

- Discuss about various types of binding forces between molecules.
 - State phase rule. Explain two-component system with an example.

OR
- Explain phenol-water system.
 - What are eutectic mixtures? Explain.
- Define refractive index and explain its determination.
 - What is free energy? Give its applications.

OR
- Explain dielectric polarization.
 - State the laws of thermodynamics.
- What are ideal and real solutions? Discuss.
 - Define colligative properties. Explain a method of determination of depression of freezing point.

OR
- Explain a method of determination of lowering of vapour pressure.
 - Define osmotic pressure and explain the determination of osmotic pressure.
- What are isotonic solutions? Explain the methods of adjusting tonicity.
 - Enumerate the applications of buffers in pharmaceutical and biological systems.

OR
- Define pH and explain the method of determination of pH.
 - Explain modern theories of acids, bases and salts.
- Discuss accelerated stability studies and give its advantages.
 - What is Arrhenius theory? Discuss.

OR
- Define expiration date of pharmaceutical formulations and explain its determination.
 - Define half-life. Explain the methods of determination of half-life.

B.Pharm II Year I Semester (R19) Supplementary Examinations September 2022
PHYSICAL PHARMACEUTICS – I

Time: 3 hours

Max. Marks: 75

PART – A
(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) Define the term highly soluble and sparingly soluble.
 - (b) Define the term Critical Solution Temperature (CST).
 - (c) What is polymorphism? What is its importance in pharmacy?
 - (d) Describe Snell's law.
 - (e) Define spreading coefficient and mention its significance.
 - (f) Give any two examples of surface-active agents.
 - (g) Explain the factors affecting plasma protein binding of drugs.
 - (h) Mention the forces that are involved in molecular complexes.
 - (i) Define buffer capacity.
 - (j) Name the two important biological buffer systems.

PART – B
(Answer any two questions: 02 X 10 = 20 Marks)

- 2 What is HLB? Describe in detail about the HLB scale for surface active agents.
- 3 Explain the kinetics and mention what are the significance of protein binding.
- 4 Write in brief about the measurement and applications of refractive index.

PART – C
(Answer any seven questions: 07 X 05 = 35 Marks)

- 5 Explain spreading coefficient and its significance.
- 6 Differentiate between crystalline solid and amorphous solid.
- 7 Discuss the thermodynamic treatment of stability constants.
- 8 Explain the various laws that are used to describe behaviour of gases.
- 9 Describe various methods used to determine solubility of gases in liquid.
- 10 Discuss eutectic mixtures and its importance in formulations.
- 11 Discuss buffers in biological systems.
- 12 Describe distribution law and its application.
- 13 Define Sorensen's pH scale. Write down different methods of determination of pH.

B.Pharm II Year I Semester (R19) Regular & Supplementary Examinations April 2022
PHYSICAL PHARMACEUTICS – I

Time: 3 hours

Max. Marks: 75

PART – A
(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- Define the term solubility.
 - Define real and ideal solution.
 - Define eutectic point. Give one example of eutectic mixture.
 - Define aerosol. Mention its application in pharmacy.
 - Why drop of liquid hanging in air is spherical in shape?
 - What is HLB value? Write any two importance of HLB scale.
 - Define chelation. Give two examples of chelating agent.
 - Define protein binding. What is its significance in pharmacy?
 - Write down the Henderson-Hasselbalch equation for weak acid and weak base.
 - Name the two important biological buffer systems.

PART – B
(Answer any two questions: 02 X 10 = 20 Marks)

- Discuss about buffer equation and write its applications in pharmacy.
- Discuss in detail about the various physicochemical properties of the drug molecules.
- Define complexation and briefly explain about inclusion complexes.

PART – C
(Answer any seven questions: 07 X 05 = 35 Marks)

- Describe the factors affecting solubility of drugs.
- Differentiate between crystalline solid and amorphous solid.
- Write a short note on 'Glassy state'.
- What is surface tension? Explain how it can be measured.
- Describe BET equation. Write different types of isotherms.
- Write down the factors affecting the solubility of gas in liquid.
- State and explain isotonic solution. How isotonicity can be adjusted?
- Explain critical solution temperature and mention its applications.
- Discuss the importance of buffers in biological and pharmaceutical systems.

B.Pharm II Year I Semester (R19) Supplementary Examinations February 2023

PHYSICAL PHARMACEUTICS - I

(For 2019, 2020 regular & 2020, 2021 lateral entry admitted batches only)

Time: 3 hours

Max. Marks: 75

PART – A
(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- | | |
|---|----|
| (a) What is distribution coefficient? | 2M |
| (b) Define dielectric constant. | 2M |
| (c) What is eutectic mixture? Give examples. | 2M |
| (d) Describe phase diagram of phenol and water system. | 2M |
| (e) How can we measure surface tension by capillary rise method? | 2M |
| (f) Explain the relation between surface free energy and surface tension. | 2M |
| (g) What is Klotz plot? | 2M |
| (h) Explain organic molecular complex. | 2M |
| (i) Define buffer capacity. | 2M |
| (j) What happens if hypertonic solution is injected i.v.? | 2M |

PART – B
(Answer any two questions: 02 X 10 = 20 Marks)

- 2 Express ideal and real solution by Raoult's law and ideal gas law. 10M
- 3 (a) Define buffer capacity. 2M
(b) Calculate the buffer capacity of an aqueous solution of the strong base sodium hydroxide having a hydroxyl ion concentration of $3.0 \times 10^{-3}M$. 8M
- 4 (a) Describe inclusion compounds. 6M
(b) What is the dynamic dialysis method? 4M

PART – C
(Answer any seven questions: 07 X 05 = 35 Marks)

- 5 Mention the influence of solvent polarity on the solubility of drug. 5M
- 6 Explain the solubility profile of pseudo-polymorphs. 5M
- 7 Write a note on critical solution temperature. 5M
- 8 Describe the effect of pressure changes on the volume of an ideal gas. 5M
- 9 Describe any two methods of surface tension measurement. 5M
- 10 Describe Langmuir adsorption isotherm. 5M
- 11 Describe pH titration method of analysis of complexation. 5M
- 12 Write details about universal indicator including its component. 5M
- 13 Explain Freundlich adsorption isotherm. 5M

B.Pharm II Year I Semester (R19) Regular Examinations March 2023

PHYSICAL PHARMACEUTICS - I

(For 2021 Regular & 2022 Lateral entry admitted batches only)

Time: 3 hours

Max. Marks: 75

PART – A
(Compulsory Question)

1 Answer the following: (10 X 02 = 20 Marks)

- | | |
|--|----|
| (a) Define partition coefficient. | 2M |
| (b) Solubility of a solid in an ideal solution depend on_____. | 2M |
| (c) Differentiate adhesive and cohesive forces with examples. | 2M |
| (d) What is polymorphism? Give examples. | 2M |
| (e) Classify surface active agents mentioning the range of HLB values. | 2M |
| (f) Mention the factors affecting spreading co-efficient. | 2M |
| (g) Describe carrier mediated transport in biological system. | 2M |
| (h) Write a short note on chelate. | 2M |
| (i) What is isotonic solution? | 2M |
| (j) Write applications of buffers. | 2M |

PART – B

(Answer any two questions: 02 X 10 = 20 Marks)

- | | |
|--|----|
| 2 (a) Define solubility terms in terms of solvent required to dissolve 1 part of solute. | 3M |
| (b) What is diffusion? Explain the law of diffusion. | 7M |
| 3 (a) Describe protein binding with Scatchard plot. | 7M |
| (b) What is the use of EDTA in drug absorption? | 3M |
| 4 (a) Define dissociation constant. What is its importance? | 5M |
| (b) Classify drugs on the basis of the dissociation constant value. | 5M |

PART – C

(Answer any seven questions: 07 X 05 = 35 Marks)

- | | |
|---|----|
| 5 Describe the influence of particle size and effective surface area on the solubility of drug. | 5M |
| 6 Write a note on BCS classification system. | 5M |
| 7 Describe phase diagram for three phase system of ice, water and vapour. | 5M |
| 8 Express Charles' Law and Avogadro Law. | 5M |
| 9 Write application of surfactant in drug delivery systems. | 5M |
| 10 Describe Du Nouy ring method. | 5M |
| 11 Mention the advantages of ultrafiltration method over equilibrium dialysis method. | 5M |
| 12 Express the kinetics of protein-drug binding. | 5M |
| 13 Explain about the factors affecting protein-drug binding. | 5M |

B.Pharm II Year II Semester (R19) Supplementary Examinations February 2023

PHYSICAL PHARMACEUTICS - II

(For 2019, 2020 regular & 2020, 2021 lateral entry admitted batches only)

Time: 3 hours

Max. Marks: 75

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- | | |
|---|----|
| (a) What do you mean by Tyndall effect? | 2M |
| (b) Define Gold number for colloidal systems. | 2M |
| (c) Define viscosity. Give the cgs unit of viscosity. | 2M |
| (d) Enumerate two properties of anti-thixotropic systems. | 2M |
| (e) Explain sedimentation volume for pharmaceutical suspension. | 2M |
| (f) What is HLB scale? Give the HLB range for o/w emulsifying agents. | 2M |
| (g) What is specific surface? Write a note. | 2M |
| (h) What is angle of repose? Give its value for indicating excellent powder flow. | 2M |
| (i) Write an equation to dictate half-life of first order reaction kinetics. | 2M |
| (j) Explain pseudo first-order reaction kinetics. | 2M |

PART – B

(Answer any two questions: 02 X 10 = 20 Marks)

- | | |
|--|----|
| 2 (a) Explain plastic flow behaviors with suitable examples. | 5M |
| (b) Explain shear rate and shear stress using a two-plate model. | 5M |
| 3 (a) Describe sieving method for the determination of mean particle diameter. | 5M |
| (b) Discuss the influence of particle shape on flow properties of powders. | 5M |
| 4 (a) Describe the method for the determination of order of reaction. | 5M |
| (b) Describe the methods of stabilization of pharmaceutical products against hydrolysis. | 5M |

PART – C

(Answer any seven questions: 07 X 05 = 35 Marks)

- | | |
|---|----|
| 5 Discuss creaming and flocculation phenomenon in terms of physical stability of emulsion. | 5M |
| 6 Differentiate between lyophilic colloids and lyophobic colloids. | 5M |
| 7 Write about purification process for the colloidal dispersions. | 5M |
| 8 Explain the theory of emulsification in brief. | 5M |
| 9 Explain thixotropy in pharmaceutical formulation. | 5M |
| 10 Explain Heckel equation in terms of deformation of solids. | 5M |
| 11 Describe liquid displacement method for the determination of true density. | 5M |
| 12 Explain total porosity and intra-particle porosity with suitable mathematical expressions. | 5M |
| 13 Derive an equation to explain zero order kinetics. | 5M |

B.Pharm II Year I Semester (R19) Regular Examinations March 2021

PHYSICAL PHARMACEUTICS – I

Time: 3 hours

Max. Marks: 75

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) What is ideal solution?
 - (b) What is meant by critical solution temperature?
 - (c) What do you mean by latent heat?
 - (d) Define sublimation.
 - (e) What is spreading coefficient?
 - (f) What is surface free energy?
 - (g) Give distribution law.
 - (h) What is protein binding of drugs? Give its significance.
 - (i) What is buffer capacity?
 - (j) What is optical rotation?

PART – B

(Answer any two questions: 02 X 10 = 20 Marks)

- 2 (a) What are partially miscible liquids? Explain.
(b) Define complexes. Classify and explain complexes with suitable examples.
- 3 (a) Define surfactants. Explain classification of surfactants with suitable examples.
(b) Elaborate on optical rotation.
- 4 (a) Explain the methods of determination of protein binding of drugs.
(b) What is refractive index? Explain the method of determination of refractive index.

PART – C

(Answer any seven questions: 07 X 05 = 35 Marks)

- 5 (a) Write about Raoult's law, ideal and real solutions.
(b) Define solubility. What are the various methods of expressing solubility?
- 6 (a) What are isotherms? Discuss about Langmuir adsorption isotherm.
(b) What is meant by dielectric constant and dissociation constant?
- 7 (a) Briefly discuss about Liquid crystalline state and Supercritical fluids.
(b) Give the pharmaceutical application of surface active agents.
- 8 (a) Write a note on liquid complexes.
(b) Explain distribution law, its limitations and applications.
- 9 (a) Write a note on isotonic solutions, hypertonic solutions and hypotonic solutions.
(b) Briefly discuss about eutectic mixtures.

Contd. in page 2

B.Pharm II Year I Semester (R15) Supplementary Examinations October 2020

PHYSICAL PHARMACY – I

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- Define latent heat.
 - Briefly explain liquid crystalline state.
 - State third law of thermodynamics.
 - What is induced polarization?
 - Brief real solution with an example.
 - Write a note on ionic strength.
 - State Bronsted – Lowry theory for acids and bases.
 - Write two applications of dissociation constant.
 - What is drug stability?
 - What is the influence of solvent on stability study?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 (a) Write a brief note on amorphous solids with two examples.
(b) List various characters of crystals.

OR

- 3 (a) Write a note on changes in state of matter.
(b) Explain two compartment with an example.

UNIT – II

- 4 (a) Define energy. Give two applications.
(b) What is entropy? Give the significance.

OR

- 5 (a) Write a note on optical rotatory dispersion.
(b) List five applications of refractive index in pharmaceuticals.

UNIT – III

- 6 (a) Explain molecular weight determination.
(b) State and brief Raoult's law with an example.

OR

- 7 (a) Explain strong electrolytes with an example.
(b) What is activity and activity coefficients?

UNIT – IV

- 8 (a) Write a note on acidity constants.
(b) List of importance of pH in pharmaceuticals.

OR

- 9 (a) What is a buffering capacity? Give the significance and mention two examples.
(b) Write a note on buffers in biologic systems.

UNIT – V

- 10 (a) Define chemical kinetics. Why shelf life is important?
(b) Explain pseudo first order reaction with an example.

OR

- 11 (a) Discuss hydrolysis in drug stability.
(b) Enlist applications of stability study.
