JHARKHAND Rai University RANCHI

PRACTICE SET FOR SUBJECTIVE QUESTIONS
End Semester (Semester - III) Examination, Dec-2025

Program: B. Pharm
Subject: Physical Pharmaceutics-I
SubjectCode: BP302T

UnitI			
S No.	**Questions**	**CO**	**Bloom's Taxonomy Level**
Section II			**Questions for 5 marks**
1	Define the term solubility of a drug.	CO1	Understand
2	Differentiate between solute and solvent in terms of their relative quantities within a solution.	CO1	Remember
3	Apply the principle of "Like Dissolves Like" to determine what type of solvent should be used to dissolve a non-polar solute.	CO1	Applying
4	Analyze the relationship between temperature and the solubility of a solid solute when the dissolution process is endothermic.	CO1	Analyzing
5	Discuss the concept of solvation and its importance in the dissolution process of drugs.	CO1	Evaluating
Section III			**Questions for 10 marks**
6	Evaluate the differences between ideal and real solutions based on intermolecular forces and enthalpy changes. Propose and justify a modified solubility parameter expression applicable to non-ideal systems.	CO1	Evaluate
7	Analyze the process of solvation in relation to drug–solvent interactions, and evaluate how different physicochemical factors influence the solubility and bioavailability of drugs in liquid systems.	CO1	Analyze
8	Discuss and compare the various methods of expressing concentration in solubility of drugs, highlighting their advantages and limitations.	CO1	Analyze
9	Compare and contrast the molecular interactions responsible for positive and negative deviations from Raoult's law, using specific examples of binary liquid mixtures.	CO1	Analyze
10	Analyze how temperature and pressure differently affect gas solubility in liquids. Explain these effects in terms of molecular kinetics and thermodynamics, and corelate your analysis to Henry's law.	CO1	Analyze

UnitII			
S No.	**Questions**	**CO**	**Bloom's Taxonomy Level**
Section II		**Questions for 5 marks**	
11	What is the relationship between volume and pressure in Boyle's Law?	CO2	Understand
12	What is the process of conversion of any solid directly into a gas without converting into a liquid?	CO2	Remember
13	What are the differences between Crystalline Solids and Amorphous Solids regarding their geometrical shape and arrangement of particles?	CO2	Analyze
14	Define Latent Heat.	CO2	Remember
15	State the definition of Relative Humidity (RH) as the ratio of water vapor amounts.	CO2	Remember
Section III		**Questions for 10 marks**	
16	Analyze how the presence of polymorphism in a drug substance affects manufacturing requirements compared to non-polymorphic drugs.	CO2	Analyze
17	Determine the physical state of the unknown substance by comparing its rigidity and fluidity to those of typical liquids and gases.	CO2	Apply
18	A solution contains a weak acid drug. If conditions are altered to substantially increase the unionized species, what effect would this have on solution pH? Analyze the outcome.	CO2	Analyze
19	Evaluate the significance of solvent dielectric constant in optimizing electrolyte drug formulations, considering its effects on dissociation, solubility, and overall therapeutic performance.	CO2	Evaluate
20	Evaluate the relative importance of latent heat compared to other thermodynamic factors for determining the feasibility and stability of this process.	CO2	Evaluate

UnitIII			
S No.	**Questions**	**CO**	**Bloom's Taxonomy Level**
Section II		**Questions for 5 marks**	
21	Define adsorption isotherm. Discuss different types of adsorption isotherms.	CO3	Understand
22	Write in brief on determination of surface tension by capillary raise method.	CO3	Apply
23	What is the term used for the accumulation of liquid molecules at the liquid surface? Explain why this phenomenon is important in determining surface tension.	CO3	Understand
24	Write a note on HLB system.	CO3	Understand
25	What is surface tension? Explain various methods for	CO3	Apply

	determination of surface tension.		
Section III		**Questions for 10 marks**	
26	Discuss why the control of surface tension would be a greater concern for the L–L interface in ensuring the resulting product quality.	CO3	Analyze
27	Evaluate the benefit of using the CGS unit (dyne/cm) in a standard pharmaceutical laboratory setting, considering that surface tension is fundamentally defined as force acting over a length.	CO3	Evaluate
28	Differentiate between surfactants with low and high HLB values in terms of their practical applications.	CO3	Analyze
29	Evaluate the effectiveness of surfactants with an HLB value of 10 in forming stable emulsion.	CO3	Evaluate
30	How would you determine the appropriate HLB value required for stabilizing a water-in-oil emulsion?	CO3	Apply
UnitIV			
S No.	**Questions**	**CO**	**Bloom's Taxonomy Level**
Section II		**Questions for 5 marks**	
31	What are Chelates? Write its usefulness in pharmacy.	CO4	Understand
32	Enumerate different methods of analysis of complex. Explain continuous variation method of analysis.	CO4	Apply
33	What is complexation? Classify only complexation.	CO4	Remember
34	Enlist different methods used in analysis of complexes and explain any one in detail.	CO4	Apply
35	What is protein binding? Write a note on the significance of drug-protein binding.	CO4	Analyze
Section III		**Questions for 10 marks**	
36	Explain the kinetics of drug-protein binding. Write down its significance.	CO4	Analyze
37	Discuss in details about complexation. Mention how drug–β-cyclodextrin complexation occurs.	CO4	Apply
38	Explain 'inclusion complex'. Give three examples and describe the importance of each of them.	CO4	Analyze
39	Explain 'Complexation'. Classify different complexes with examples. Add notes on the analysis by distribution method.		Analyze
40	Write the classification of complexes. How are inorganic complexes formed? Explain with suitable examples and ionic configuration.		Apply
UnitV			
S No.	**Questions**	**CO**	**Bloom's Taxonomy Level**
Section II		**Questions for 5 marks**	
41	Define buffer solution. List the two main types of buffer solution, providing one specific chemical example for each type.	CO5	Remember
42	State the relationship between pH, pKa, and the concentrations of Acid and Salt for an Acidic Buffer (Henderson-Hasselbalch Equation). Starting from the definition of the dissociation constant	CO5	Apply

	(Ka), derive the expression for $[H^+]$ in terms of Ka and the concentrations of Acid and Salt.		
43	Describe the overall principle of the Hemolytic Method for determining tonicity. Based on the principle of osmosis, explain the general movement of solvent particles between areas of concentration.	CO5	Understand
44	What are the two main methods used for adjusting the tonicity of solutions? State which class is typically used for adjusting Hypotonic solutions and which is used for adjusting Hypertonic solutions.	CO5	Apply
45	Explain the concentration difference between the solution and the blood cell, the direction of solvent movement, and the resulting appearance of the red blood cell.	CO5	Analyze
Section III		**Questions for 10 marks**	
46	Evaluate the importance of maintaining correct tonicity in pharmaceutical preparations, discussing potential clinical consequences of using paratonic solutions.	CO5	Evaluate
47	Analyze how the composition and pH range of different biological buffers influence the stability and bioavailability of pharmaceutical formulations.	CO5	Analyze
48	Evaluate the effectiveness of different buffer systems used in pharmaceutical formulations and biological systems in terms of pH control, compatibility, and stability	CO5	Evaluate
49	Derive the buffer equation for a weak acid and its salt. Calculate pH of the buffer solution containing 0.5 M each of acetic acid and sodium acetate, respectively. (Given: pKa of acetic acid is 4.76).	CO5	Analyze
50	Explain any one Class I method to adjust isotonicity. Calculate the amount of sodium chloride required in producing a 200 mL solution of 1% apomorphine hydrochloride isotonic with blood serum? (Given: Freezing point depression of 1% apomorphine =0.08). Freezing point depression of 1% w/v sodium chloride is 0.576°C.	CO5	Apply

Course Outcomes (CO): On the successful completion of the Course, students will be able to: -

CO1: Explain the gross morphology, structure and functions of nervous systems.

CO2: Identify the various parts, role and physiology of digestive system.

CO3: Describe the functioning and anatomy of respiratory and urinary system.

CO4: Discuss the various physiological aspect of endocrine system.

CO5: Explain working pattern of reproductive organs and basic knowledge of genetics.

Summary Sheet

CO Wise	
CO	Q. No Marks
CO1:1, 2, 3, 4, 5, 6, 7, 8, 9,10	75
CO2:11, 12, 13, 14, 15, 16, 17, 18, 19, 20,	75
CO3:21, 22, 23, 24, 25, 26, 27, 28, 29, 30,	75
CO4:31, 32, 33,34, 35, 36, 37, 38, 39, 40,	75
CO5:41, 42,43, 44, 45, 46, 47, 48, 49, 50	75
Total Marks:	375
Unit Wise	
Unit Q. No Marks	
Unit 1:1, 2, 3, 4, 5, 6, 7, 8, 9,10	75
Unit 2:11, 12, 13, 14, 15, 16, 17, 18, 19, 20,	75
Unit 3:21, 22, 23, 24, 25, 26, 27, 28, 29, 30,	75
Unit 4:31, 32, 3334, 35, 36, 37, 38, 39, 40,	75
Unit 5:41, 4243, 44, 45, 46, 47, 48, 49, 50	75
Total Marks:	375
Blooms Taxonomy Level (BTL) Wise	
BTL Q. No Marks	
LOT = 1, 2, 3, 4, 5,1011,12,13,14,15,20,2122,23,24,25,30,31,32,33,34,35,40,41,42,43,44,45	125
HOT = 6,7,8,9,10,16,17,18,19,20,26,27,28,29,30,36,37,38,39,40,46,47,48,49,50	250
Total Marks:	375

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Disclaimer: -This is a Practice Set. The Question in End term examination will differ from the Practice Set. This Practice Set is meant for practice only.