Seat No.: _____ Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.PHARM – SEMESTER – 3 EXAMINATION – SUMMER-2025

Subject Code: BP302TP **Date: 31 - 05 - 2025**

Subject Name: Physical Pharmaceutics I

Time:02.30 PM TO 05.30 PM **Total Marks: 80**

Instructions:

1. **Attempt any five questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Give the mathematical expression of *Nernst's* law. Explain the limitation of distribution law.	**06**
	(b)	Define and explain solubility. Discuss different solubility expressions.	**05**
	(c)	Write a note on liquid crystals.	**05**
Q.2	**(a)**	Derive the equation of the spreading coefficient. Discuss the applications of the spreading coefficient in pharmacy.	**06**
	(b)	Explain the factors that influence drug solubility.	**05**
	(c)	Enumerate methods used for determination of HLB value.	**05**
Q.3	**(a)**	Name different methods used for the determination of surface tension. Describe the capillary rise method in detail.	**06**
	(b)	State and derive Raoult's law.	**05**
	(c)	With neat diagram explain the critical point and eutectic mixture.	**05**
Q.4	**(a)**	Define polymorphism. Describe its applications in pharmacy.	**06**
	(b)	Write limitations and applications of distribution law.	**05**
	(c)	Write a short note on chelate-type complexes.	**05**
Q.5	**(a)**	Is the following statement True or False? Justify your answer: "Refractive index is lesser than one for substances denser than air". Discuss the applications of the refractive index.	**06**
	(b)	What are the characteristics of buffers? Derive Henderson-Hasselbalch's equation for an acidic buffer.	**05**
	(c)	Discuss the applications of buffers in pharmaceutical and biological systems.	**05**
Q.6	**(a)**	What is the mechanism of complex formation between PABA and caffeine? Explain the method to determine the formation of complex and stability constant for this complex.	**06**
	(b)	Define and discuss the application of the dielectric constant.	**05**
	(c)	Discuss different types of adsorption isotherms.	**05**
Q.7	**(a)**	Define 'complex compounds'. Discuss inclusion complexes in detail	**06**
	(b)	Explain isotonicity with its importance. How isotonicity is maintained in buffer solution.	**05**
	(c)	Discuss the applications of drug-protein binding in drug activity.	**05**

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