Q.P. Code : 27797

[Time: 3 Hours] **[Marks: 80]**

Please check whether you have got the right question paper.

N.B: 1. All questions are compulsory.

1.	a)	Classify different types of intermolecular forces of attraction.	**02**
	b)	State Joule Thompson effect.	**02**
	c)	Give the expression for molar refraction.	**02**
	d)	Draw phase diagram of a two component system with lower consolute temperature.	**02**
	e)	State Henry's Law of solubility of gasses in liquids.	**02**
	f)	Acetic acid is a weak electrolyte. Comment.	**02**
	g)	Calculate the pH value of a solution whose hydrogen ion concentration is 0.006 mol/L.	**02**
	h)	Name any two methods for determination of surface tension.	**02**
	i)	What are wetting agents? Give examples.	**02**
	j)	Explain the terms relative viscosity and viscoelasticity.	**02**
2.	a)	What is critical phenomena? Explain critical phenomena with respect to carbondioxide isotherms.	**04**
	b)	What is isotonicity? Explain any one class II method for adjusting isotonicity.	**04**
	c)	Explain upper and lower consolute temperatures with respect to nicotine-water system.	**04**
3.	a)	Define refractive index. Explain the working of Abbe's refractometer.	**04**
	b)	Define pH. Explain buffers in biological systems.	**04**
	c)	Write a note on HLB. Calculate HLB of a surfactant having saponification value of 90 and acid value of 145.	**04**
4.	a)	Explain in detail azeotropic mixtures. Calculate the vapour pressure lowering caused by the addition of 50 g of sucrose (Mol.wt = 342) to 1000g of water. The vapour pressure of pure water at 25^0C is 23.8mm of Hg.	**04**
		OR	
		State deviations from Raoult's Law & calculate the vapour pressure lowering on addition of 53.94g of a substance of molecular mass 182 to 1000g of water at 20^0C. At this temperature, vapour pressure of pure water is 17.5mm Hg.	
	b)	State distribution Law. Explain any 2 applications in Pharmacy.	**04**
	c)	Derive buffer equation for basic buffers.	**04**
5.	a)	What is polymorphism? Give the pharmaceutical significance of polymorphs.	**04**
	b)	Define adsorption isotherm. Explain different types of adsorption isotherms.	**04**
	c)	What are non-newtonian systems? Explain pseudoplastic flow in detail.	**04**
		OR	
		Classify non-newtonian systems and differentiate between pseudoplastic and dilatant systems.	
6.	a)	Write a note on supercritical fluid state.	**04**
	b)	Describe capillary rise method **OR** drop number method to determine surface tension.	**04**
	c)	Explain any one method for measurement of flow of non-newtonian systems.	**04**