

[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 25⁰C 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 20⁰C. 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**