

Please check whether you have got the right question paper.

N.B: 1. All questions are compulsory.

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|----|----|---|----|
| 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 <sup>0</sup> C is 23.8mm of Hg.               | 04 |
|    |    | <b>OR</b>   |    |
|    |    | 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 <sup>0</sup> C. 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 |
|    |    | <b>OR</b>   |    |
|    |    | 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 <b>OR</b> drop number method to determine surface tension.   | 04 |
|    | c) | Explain any one method for measurement of flow of non-newtonian systems.  | 04 |