

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: B. PHARM.
BRANCH: PHARMACY

SEMESTER : III
SESSION : MO/2022

SUBJECT: BP302T PHYSICAL PHARMACEUTICS

TIME: 3:00 Hours

FULL MARKS: 75

INSTRUCTIONS:

1. The missing data, if any, may be assumed suitably.
 2. Before attempting the question paper, be sure that you have got the correct question paper.
 3. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
 4. This question paper consists of (03) three parts. Read the part wise instructions before attempting the questions.
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PART-I

Objective types questions (Instruction: Answer all questions)

Q1. (10 x 2 = 20 Marks)

- A. Gases are often liberated from solutions in which they are dissolved by the introduction of an electrolyte. This phenomenon is known as
- B. Define the term "partition coefficient"
- C. As the forces of attraction between the molecules increase, the potential energy becomes increasingly
- D. Define critical temperature.
- E. Defend the following statement: Interfacial tensions are less than surface tensions.
- F. When the number of counter ions is same as potential determining ions, zeta potential will be
- G. In a method of continuous variation when there is a change in slope at a mole fraction of 0.5, the stoichiometric ratio is
- H. In the treatment of Urinary calculi, amongst following complexes which is used: (a) EDTA, (b) PVP-Iodine complex, (c) aminophylline
- I. The pH of 0.01 M HCl is
- J. What will happen when red blood cells are suspended in hypertonic solution

PART-II

Short Answers

(Instruction: Answer seven out of nine questions)

(7 x 5 = 35 Marks)

- Q2. If benzoic acid is distributed between equal volumes of peanut oil and water, what must be the original concentration in the water phase in order that 0.25 mg/mL of undissociated acid remains in the aqueous phase buffered at a pH of 4.01 The partition coefficient $K = [HA_o]/[HA_w]$ is 5.33 and the dissociation constant of the acid in water is 6.4×10^{-5} . Since the two phases are present in equal amounts consider $q=1$.

- Q3. Justify the following statement: "Most efficient extraction results when a large number of extractions are carried out with small portions of extracting liquid"
- Q4. Differentiate between 'Smectic mesophases' and 'Nematic mesophases'.
- Q5. A sample of chloroform rose to a height of 4.67 cm at 20 °C in a capillary tube having an inside radius of 0.02 cm. What is the surface tension of chloroform at this temperature? The density of chloroform is 1.476 g/cm³
- Q6. Derive an equation to prove the following statement: Spreading will occur when the surface tension of the sublayer liquid is greater than the sum of the surface tension of the spreading liquid and the interfacial tension between the sublayer and the spreading liquid.
- Q7. What are pharmaceutical applications of complexes.
- Q8. Enumerate and discuss the significance of protein binding.
- Q9. A quantity of HCl (1.5×10^{-3} M) is added to water at 25 °C to increase the hydrogen ion concentration from 1×10^{-7} to 1.5×10^{-3} mole/liter. What is the new hydroxyl ion concentration?
- Q10. Discuss biological buffer system of blood and Urine.

PART-III

Long Answers

(Instruction: Answer two out of three questions)

(2 x 10 = 20 marks)

- Q11. Derive and analyze an equation for pH below which the salt of a weak acid begins to precipitate from aqueous solution.
- Q12. Using suitable illustration, describe the localization of drugs of various polarity in a micelle with non-polar core.
- Q13. Explain pH titration method using suitable example to analyse complexes.

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