

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

CLASS: BPHARM
BRANCH: PHARMACY

SEMESTER: III
SESSION: MO/2019

SUBJECT: BP302T PHYSICAL PHARMACEUTICS - I

TIME: 3.00 Hours

FULL MARK: 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. At which equilibrium distance of molecules, the attractive and repulsive forces are equal.
- B. Write the upper and lower consolute temperature of nicotine-water system.
- C. Write the relationship between the vapour pressure and the absolute temperature of a liquid.
- D. If an underwater diver experiences 2 atm of pressure what will be the depth of the water?
- E. The glass transition temperature of a molecular dispersion is
- F. The pKa of an acidic drug is 4.9. At which pH of the solvent, the equilibrium solubility study must be performed to determine the solubility of its unionized form.
- G. The mole fraction solubility (a_2) of a solute in a solvent (mol. Wt = M) can be converted to molality (m) by _____
- H. For a non-ideal solution, the partial free energy change (ΔG_2) involved in the transfer of 1 mole of solute phase to a saturated solution is
- I. The dipole moment of Nitrobenzene and Phenol is 4.2×10^{-18} esu. cm and 1.7×10^{-18} esu. cm, respectively. The aqueous solubility of nitrobenzene and phenol is 0.0155 mole/kg and 0.95 mole/kg, respectively. Explain the phenomenon.
- J. Write down the formula for phase rule for the condensed system.

PART-II

Short Answers

(Instruction: Answer seven out of nine questions)

(7 x 5 = 35 Marks)

- Q2. Calculate the solubility of weakly acidic molecule as influenced by pH.
- Q3. Derive the buffer equation for a weak base and its salt.
- Q4. Write a short note on solid dispersion and its characterization techniques.
- Q5. Derive the equation by which we can measure the solubility of a basic drug in the presence of surfactant.
- Q6. Describe the various method to calculate the HLB value of a surfactant.
- Q7. Write a note on aerosol dosage form and its application in pharmacy.
- Q8. Describe the phase diagram of two-component systems containing solid and liquid phases.
- Q9. Write the rules relating to triangular diagrams.
- Q10. Discuss the phase rule of a system containing one component.

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PART-III
Long Answers
(Instruction: Answer two out of three questions)

(2 x 10 = 20 marks)

- Q11. State powder X-ray diffraction method to characterize i) crystalline; ii) polymorphs and iii) amorphous materials.
- Q12. Describe the effect on partition on ionic dissociation and molecular association.
- Q13. Write short note on i) surface free energy; ii) spreading coefficient.

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