

# UKA TARSADIA UNIVERSITY

B.Pharm. (3rd Semester)

Subject :030020301-Physical Pharmacy I

Time : 2.30 pm to 5.30 pm

Duration : 3 Hours

Date : 15/05/2014

Max. Marks : 70.

## Instructions:

1. Attempt all questions.
2. Write each section in a separate answer book.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks allocated to that question.
5. Draw diagrams/figures whenever necessary.

## SECTION - 1

### Q-1 (A) Do as directed.

[07]

- I) Write the statement of Henry's law
- II) Enlist different terms for expressing the concentration of solute.
- III) Give the importance of tie line.
- IV) Give two properties of glassy state.
- V) Give two examples of partially miscible liquids
- VI) Write the statement of phase rule.
- VII) What are the types of Inhalers?

### Q-1 (B) Answer the following in brief. (Any 4)

[08]

- I) Give BCS classification.
- II) Give difference between ideal and real solutions.
- III) Comment: Boiling point of solution having non volatile solute is always lower than boiling point of solvent
- IV) Define Latent heat with heat of fusion and heat of vaporization
- V) Give difference between osmosis and diffusion.
- VI) Write significance of liquid crystals.

### Q-2 Answer the following.

[10]

- A) Explain Critical Solution Temperature with example. Show the calculations of compositions on Tie line.

## OR

- A) Explain sublimation with phase diagram and examples. Define triple point and write its importance.
- B) i) Five gram of non electrolyte drug is dissolved in 500 gm of water. The freezing point depression is found to be 0.060 degree C. Calculate the molecular weight of drug. Molal cryoscopic constant of water is 1.86.  
ii) Melting point of camphor is 180 °C and of mixture of naphthalene (mol. Wt = 128g/mole) in 10 gm of camphor is 150 °C. Find the cryoscopic constant of camphor.

## OR

- B) Enlist colligative properties of solutions. Explain any one in detail with measurement method.

### Q-3 Answer the following in detail. (Any 2)

[10]

- A) Explain two component systems containing solid liquid phase (Eutectic mixture).
- B) Explain factors affecting solubility of drug. Explain the solute solvent interactions for polar and nonpolar solvents.

C) What is polymorphism? Describe its importance with example.

## **SECTION - 2**

**Q-4 (A) Do as directed.**

**[07]**

- I) Define buffer capacity.
- II) Suggest two methods to improve the flow property of powders.
- III) What are the advantages of cone and plate viscometer over cup and bob viscometer?
- IV) Define Angle of repose.
- V) How is the yield value determined?
- VI) Write disadvantages of microscopy method for powders.
- VII) Which type of flow will be followed by solution of methyl cellulose?

**Q-4 (B) Answer the following in brief. (Any 4)**

**[08]**

- I) What is thixotropy? Explain how the thixotropy depends on rate of shear.
- II) Write applications of rheology
- III) Calculate the porosity of the sample of aluminium oxide having true density of  $4.0 \text{ g/cm}^3$ . When 75g of powder was placed in a graduated cylinder, the  $\text{Al}_2\text{O}_3$  was found to have bulk volume of  $62\text{cm}^3$ .
- IV) The weight of KBr was 0.36 gm and bulk volume was 0.12 cubic cm. The true density of KBr is 4.2 g/cc. Find bulk density and porosity of the tablet.
- V) Write the importance of buffers in pharmaceutical systems.
- VI) Comment: In powders any degree of porosity is possible.

**Q-5 Answer the following.**

**[10]**

- A) Give principle, diagram, procedure and applications of cup and bob viscometer.

**OR**

- A) Describe Andreasen pipette method for analyzing the particle size.
- B) The pH of a buffer solution containing 0.5 moles/lit of  $\text{CH}_3\text{COOH}$  and 0.5 moles/lit  $\text{CH}_3\text{COONa}$  has been found to be 4.76. What will be the pH of this solution after 0.1 moles/lit HCl has been added to buffer? Assume that volume is unchanged.  $K_a = 1.75 \times 10^{-5}$ .

**OR**

- B) Derive Henderson-Hasselbach equation or buffer equation for weak acid & its salt and weak base & its salt.

**Q-6 Answer the following in detail. (Any 2)**

**[10]**

- A) Distinguish between the types of Non Newtonian Systems according to their characteristics, equations and examples.
- B) Enlist different methods for adjustment of tonicity and describe any one method.
- C) Explain conductivity method for the particle size measurement in detail with diagram.