UKA TARSADIA UNIVERSITY
B.Pharm. (3rd Semester)
Subject :030020301 **-** Physical Pharmacy I

Duration: 3 Hours   **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) Answer the following.   **[07]**

I) Define Saturated Solution.

II) Give the statement of Henry's law.

III) Give the examples of partially miscible and immiscible liquids.

IV) Why the solubility of gases decrease with temperature?

V) Comment: Boiling point of solution having non volatile solute is always lower than boiling point of solvent

VI) Give the statement of phase rule.

VII) Enumerate factors affecting solubility of drug.

Q-1 (B) Answer the following in brief. (Any 4)   **[08]**

I)   Define Latent heat of fusion and vapor pressure.

II) Comment with reason: The balance of enthalpy, entropy and temperature determines spontaneous changes in states of matter.

III) Define Molarity and osmotic pressure.

IV) Write Raoult's law of Ideal solutions.

V)   Explain Ebullioscopy.

VI) Why NaCl is not soluble in benzene?

Q-2 Answer the following.   **[10]**

A)   Explain Critical solution Temperature with example. Show the calculations of compositions on tie line.

                   OR

A)   Draw the phase diagram of two-component system containing solid and liquid phases. Explain the regions in the phase diagram. Give definition of eutectic point and examples of eutectic mixtures.

B)   Define and enlist Colligative properties. Discuss Arrhenius theory of electrolyte dissociation.

                   OR

      Classify the solvents according to their polarity. Explain the mechanism of
B)   solubilization by polar solvents. How pH affects solubility?

Q-3 Answer the following in detail. (Any 2) [10]

   A) What is polymorphism? Discuss its significance in Pharmacy.

   B) Describe ideal and real solutions with examples

   C) Discuss solute-solvent interaction in relation to solubility.

Section-2

Q-4 (A) Answer the following. [07]

   I) Enumerate methods to adjust tonicity.

   II) Define Equivalent spherical diameter.

   III) Write two applications of micromeritics in pharmacy.

   IV) Enumerate the derived properties of powders

   V) What is yield value?

   VI) Which type of flow is exhibited by methyl cellulose in water?

   VII) Write Newton's law of flow.

Q-4 (B) Answer the following in brief. (Any 4) [08]

I) Comment: In real powders any degree of porosity is possible.

II) Comment: Multipoint viscometers are used for Non Newtonian system.

III) A plastic material has yield value of 1700 dyne/cm². If the rate of shear was 130/sec, when the shearing stress was 7000 dyne/cm², calculate plastic viscosity of material.

IV) Explain buffer capacity.

V) Explain drugs as buffers.

VI) The time required by a ball in a falling sphere viscometer to fall from fixed marks was 0.5 sec., sp. Gravity of ball is 1.5 g/cc and that of liquid is 0.90 g/cc. Calculate the viscosity of liquid. The constant for ball B is 0.08.

Q-5 Answer the following. [10]

A) Explain the shear thinning systems with their characteristics, equations and examples.

                OR

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

B) Discuss the derived properties of powders with their measurement.

                OR

B) Prepare acetate buffer solution of pH 5 having buffer capacity of 0.02. pKa of acetic acid is 4.76. The ratio of salt to acid is 1.74:1. Calculate acid and salt concentration in mole per litre.

Q-6 Answer the following in detail. (Any 2) [10]

A) What is thixotropy? Explain how the thixotropy depends on rate of shear and length of time of shear.

B) Explain principle and mechanism of buffers.

C) Describe the particle volume measurement with the help of a labeled diagram.