Roll No.						

Total No. of Pages: 02

Total No. of Questions: 09

B.Sc. (BT)

PHYSICAL CHEMISTRY Subject Code: BSBT-201-18 M Code: 75872

(Sem. - 2)

## Date of Examination : 20-12-2022

Time: 3 Hrs.

Max. Marks: 60

**INSTRUCTIONS TO CANDIDATES:** 

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

## **SECTION-A**

- 1. Answer the following:
  - a) What is Activity and Activity Coefficient of a reaction?
  - b) Calculate the entropy of mixing when 15g of benzene is mixed with 15g of cyclohexane.
  - c) State and explain the degree of freedom for a linear and non-linear molecule.
  - d) Give the relation between free energy and enthalpy of a reaction.
  - e) Explain Henry's law.
  - f) What is the half-life of a complex reaction?
  - g) What is resistance and its units?
  - h) Explain parallel reaction with a suitable example.
  - i) Give the relationship between entropy and enthalpy of a reaction.
  - j) What are buffer solutions and why are they used?

## **SECTION-B**

- 2. Explain Hess's Law of heat summation.
- 3. Explain conductometric titration between weak acid and strong base.
- 4. State and derive the  $2^{nd}$  law of thermodynamics.
- 5. What are consecutive and opposing reactions?
- 6. Calculate the vapour pressure of the ideal and non-ideal solution.

## **SECTION-C**

- 7. Derive Gibb's Helmhotz Equation and Nernst Heat Theorem.
- 8. What are the factors influencing the solubility of gas in liquids? What is osmotic pressure and its common features and application?
- 9. What is the theory of strong electrolytes and calculate the rate equations for 1<sup>st</sup> and 3<sup>rd</sup> order reaction?

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.