

Enrollment No: \_\_\_\_\_

Exam Seat No: \_\_\_\_\_

# C.U.SHAH UNIVERSITY

## Summer Examination-2020

**Subject Name: Physical Chemistry - I**

**Subject Code: 5SC01PCH1**

**Branch: M.Sc. (Chemistry)**

**Semester : 1**

**Date : 28/02/2020**

**Time : 02:30 To 05:30**

**Marks : 70**

**Instructions:**

- (1) Use of Programmable calculator and any other electronic instrument is prohibited.
  - (2) Instructions written on main answer book are strictly to be obeyed.
  - (3) Draw neat diagrams and figures (if necessary) at right places.
  - (4) Assume suitable data if needed.
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### SECTION – I

- Q-1 Attempt the Following questions (07)**
- a. Define phase space. **01**
  - b. What is thermodynamic probability? **01**
  - c. What do you mean by micro and macro states? **01**
  - d. Define heat capacity. **01**
  - e. What is entropy? **01**
  - f. Define non ideal solution. **01**
  - g. Define fugacity. **01**
- Q-2 Attempt all questions (14)**
- a. Discuss the derivation of Boltzmann-Maxwell. **5**
  - b. Discuss the graphical method for fugacity. **4**
  - c. Write a note on **5**
    1. Third law of thermodynamics.
    2. Applications of partition function to monoatomic gases.
- OR**
- Q-2 Attempt all questions (14)**
- a. Discuss the derivation of Bose-Einstein. **5**
  - b. Explain the advantages of equilibrium constants of empathetic reactions. **4**
  - c. Write a note on **5**
    1. Fugacity of Solids.
    2. Fugacity of Liquids.
- Q-3 Attempt all questions (14)**
- a. Discuss the derivation of Fermi- Dirac statistics. **10**
  - b. Discuss the Fugacity in gas mixtures. **4**
- OR**
- Q-3 Attempt all questions**
- a. Discuss the applications of partition function to monoatomic gases. **10**
  - b. Discuss the Equation of State Method for fugacity. **4**



## SECTION – II

- Q-4**      **Attempt the Following questions**      **(07)**
- a. Define ideal solution.      **01**
  - b. What do you mean by freezing point of non-ideal solution?      **01**
  - c. Define boiling point.      **01**
  - d. Write any two weak acids name.      **01**
  - e. What are Free energies?      **01**
  - f. Define Standard entropies.      **01**
  - g. Define vapor pressure curves.      **01**
- Q-5**      **Attempt all questions**      **(14)**
- a. Discuss the **types of solutions**.      **5**
  - b. Draw the general equations for non-ideal liquid mixtures.      **5**
  - c. Write a note on      **4**
    - 1. Partially miscible liquids.
    - 2. Deviation from ideal behavior.
- OR**
- Q-5**      **Attempt all questions**
- a. Differentiate ideal and non-ideal solutions.      **5**
  - b. Explain free energies of formation of ions.      **4**
  - c. Write a note on      **5**
    - 1. Vapor pressure curves.
    - 2. Liquid compositions
- Q-6**      **Attempt all questions**      **(14)**
- a. Discuss the Duhem Margules equation.      **10**
  - b. Discuss the thermodynamics of ions in solutions.      **4**
- OR**
- Q-6**      **Attempt all Questions**
- a. Discuss the standard entropies of ions and applications.      **10**
  - c. Discuss Henry's law.      **4**

