Enrollment No: _____ Exam Seat No: _____

C. U. SHAH UNIVERSITY
Winter Examination-2020

Subject Name: Physical Chemistry-I

Subject Code: 5SC01PCH1 **Branch: M.Sc. (Chemistry)**

Semester: 1 **Date: 10/03/2021** **Time: 11:00 To 02:00** **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.

SECTION – I

Q-1 **Attempt the Following questions** **(07)**

a. Define phase space **01**
b. What is called microstate? **01**
c. What do you mean by ensemble? **01**
d. What is known as statistical equilibrium? **01**
e. Define fugacity **01**
f. What do you mean by standard state? **01**
g. Write Van der Waal's Equation. **01**

Q-2 **Attempt all questions** **(14)**

a. Write a note on thermodynamic probability. **07**
b. Discuss the determination of fugacity of mixture of gases. **07**

OR

Q-2 **Attempt all questions** **(14)**

a. Discuss the Bose-Einstein statistics. **08**
b. Explain the approximate method for the determination of fugacity of gas. **06**

Q-3 **Attempt all questions** **(14)**

a. Derive the equation for entropy and probability. **07**
b. Write note on the Fermi-Dirac statistics. **07**

OR

Q-3 **a.** Discuss the variation of fugacity with temperature and pressure for the pure gas. **08**
b. Explain the types of Ensembles. **06**

SECTION – II

Q-4		**Attempt the Following questions**	**(07)**
	a.	Define: Solute and Solvent	**01**
	b.	What is called entropy?	**01**
	c.	What do you mean by molality?	**01**
	d.	Define standard electrode potential	**01**
	e.	Give Raoult's law.	**01**
	f.	What is known as electrochemical series?	**01**
	g.	Define: Ideal solution	**01**
Q-5		**Attempt all questions**	**(14)**
	a.	Derive Duhem-Margules Equation.	**07**
	b.	Write a short note on single electrode potential.	**07**

OR

Q-5		**Attempt all questions**	
	a.	Derive relation for freezing point of dilute solution.	**07**
	b.	Calculate standard potential from equilibrium constant & free energy.	**07**
Q-6		**Attempt all questions**	**(14)**
	a.	Explain theory of fractional distillation of binary solution.	**07**
	b.	Write characteristics of reversible and irreversible cell.	**07**

OR

Q-6		**Attempt all Questions**	**(14)**
	a.	Discuss vapour pressure curves for ideal solutions.	**07**
	b.	Discuss the construction and working of galvanic cell.	**07**