Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2018

Subject Name: Physical Chemistry-I

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

Semester: 1 **Date: 23/03/2018** **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.

SECTION – I

Q-1		**Attempt the Following questions**	**(07)**
	a	Define the macro and micro state.	**1**
	b	Define the term Fugacity?	**1**
	c	What do you mean by heat capacity?	**1**
	d	Define the internal energy.	**1**
	e	Define work function.	**1**
	f	What is called heat content?	**1**
	g	What do you meant by vibrational state function?	**1**
Q-2		Attempt all questions	**(14)**
	a	Discuss Derivation of Boltzmann Maxwell.	**10**
	b	Derive expression of rotational partition function.	**04**
		OR	
Q-2		Attempt all questions	**(14)**
	a	Explain the determinations of Fugacity in Gas Mixtures or The Lewis Randall Rule.	**05**
	b	Derive the relation between Debey-Huckel theory and osmotic coefficient.	**05**
	c	Explain the equilibrium constant.	**04**
Q-3		Attempt all questions	**(14)**
	a	Discuss Boltzmann distribution law in detail	**10**
	b	Calculate the standard entropy of zinc at 25^{o}C (Atomic weight =65.38).	**04**
		OR	
Q-3		Attempt all questions	**(14)**
	a	Explain the third law of thermodynamics.	**05**

	b	Explain the Graphical Method for fugacity.	**05**
	c	Explain the thermodynamic probability.	**04**

SECTION – II

Q-4		Attempt the Following questions	**(07)**
	a	Define the terms solute and solvent.	**01**
	b	Define dissociation constant.	**01**
	c	What do you mean by free energy?	**01**
	d	Define standard potential.	**01**
	e	What do you mean by heat of formation?	**01**
	f	Define the term: Dilute solution.	**01**
	g	Define: Vapour pressure.	**01**
Q-5		Attempt all questions	**(14)**
	a	Derive the relation for equilibrium constant for homogenous reactions in dilute Solution.	**05**
	b	Discuss the Duhem Margules equation.	**05**
	c	Explain the properties of ideal solution.	**04**

OR

Q-5		Attempt all questions	**(14)**
	a	Derive the general equation for liquid mixtures.	**05**
	b	Derive relation for freezing point of dilute Solution.	**05**
	c	Determine the dissociation constant of water.	**04**
Q-6		Attempt all questions	**(14)**
	a	Explain the Henry's law.	**05**
	b	Explain the determination of molecular weight by boiling point.	**05**
	c	10 gram of a substance of molecular weight 186, when dissolved in 100 gms ofwater lowered the freezing point of latter by 1.0^{o}C. Calculate the molal freezing point constant of water.	**04**

OR

Q-6		Attempt all questions	**(14)**
	a	Explain the vapor pressure curves for ideal solution.	**05**
	b	Explain the determination of molecular weight by freezing method.	**05**
	c	Give the applications of standard entropy.	**04**