PP SAVANI UNIVERSITY

Fifth Semester of B.Sc. Examination
December-2021
SSCH3130– Physical Chemistry- VII

11.12.2021, Saturday **Time: 12:30 PM to 3:00 PM** **Maximum Marks: 60**

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

Section-I (Total Marks - 30)

Q.1 Short Questions **[10]**

1.1 Objectives **[05]**

1.1a When was Nernst give Heat Theorem

A 1905
B 1907
C 1906
D 1908

1.1b The term Helmholtz free energy change indicate as

A ΔU
B ΔA
C ΔG
D ΔH

1.1c The term internal energy change indicates as

A ΔU
B ΔA
C ΔG
D ΔH

1.1d The heat capacities of the crystalline indicate as

A $C_P(c)$
B $C_P(l)$
C $C_P(g)$
D $C_P(v)$

1.1e Which is Strong electrolyte

A CH_4
B NH_3
C KCl
D NaCl

1.1f In this a = γ m equation what is γ

A activity
B activity coefficient
C molality
D molarity

1.1g Fugacity is a measure of the

A Relative volatility of a mixture of two miscible liquids
B Behaviour of ideal gases
C Escaping tendencies of the same substance in different phases of a system
D None of these

1.1h The amount of heat required to increase the temperature of a certain mass of a substance by a certain amount is called

A specific heat
B Heat capacity
C Internal Heat
D Specific mass

1.1i The term "activity" was introduced by whose?

A Arrhenius
B Lewis
C Lawry
D Gibbs

1.1j What is consider as reference pressure

A 0 bar
B 1 bar
C 2 bars
D 100 bars

1.2 Answer the Following: (MCQ/Short Question/Fill in the Blanks) **[05]**

1.2a Define: Heat
1.2b Define: Thermodynamic
1.2c The amount of heat required to increase the temperature of a certain mass of a substance by a certain amount is called _____
1.2d Unit of pressure is _____
1.2e ΔS is always Positive: True/False

Q.2 Short Notes (Attempt any two) **[06]**

A Measurement of Activity
B Absolute Entropies
C Lewis –Randall Rule

Q.3 Explain in detail (Attempt any two) **[14]**

A Fugacity

B The concept of Activity and activity coefficient

C Explain a) Standard State b) Nernst Heat Theorem

Section-II (Total Marks - 30)

Q.1 Short Questions **[10]**

1.1 Objectives **[05]**

1.1a Which law has statistical nature

- **A** Zeroth law of Thermodynamic
- **B** First law of Thermodynamic
- **C** Second law of Thermodynamic
- **D** Third law of Thermodynamic

1.1b The collection of particles called

- **A** Assembly
- **B** System
- **C** Ensemble
- **D** Semble

1.1c The number n1, n2, n3..... are called _____

- **A** Total number
- **B** Calculate number
- **C** Distribution number
- **D** Complex number

1.1d Who gave the concept of thermodynamic probability

- **A** Gibbs
- **B** Lawery
- **C** palnk
- **D** Plank

1.1e How many types of Statistics in different physical situation

- **A** 2
- **B** 4
- **C** 3
- **D** 5

1.1f In translation partition function what is ε_t is

- **A** Translation energy
- **B** Translation direction
- **C** Translation weight
- **D** Translation level

1.1g Particles obeying M-B statistics are called

A maxwellons
B bosons
C fermions
D quantum's

1.1h The distribution function is given by _____

A 1/AeEnT−1
B 1/AeEnT+1
C 1/eEnT+A
D 1/eEnT−A

1.1i Maxwell-Boltzmann statistics cannot be applied to _____

A Photons
B Molecules
C Atoms
D Lattice

1.1j A Phase space is a hypothetical space and can be imagined with_____

A 1*f*-axes
B 2*f*-axes
C 3*f*-axes
D 4*f*-axes

1.2 Answer the Following: (MCQ/Short Question/Fill in the Blanks) **[05]**

1.2a Define: Unit cell
1.2b What is microscopic state?
1.2c What is Occupation number?
1.2d Full form of B-E statistics
1.2e Define: Fermions

Q.2 Short Notes (Attempt any two) **[06]**

A Theorem of Probability
B Types of Statistics
C Molar Partition Function

Q.3 Explain in detail (Attempt any two) **[14]**

A Explain Fundamentals of Statistical Methods
B Explain Bose-Einstein and Fermi-Dirac statistics distribution laws for crystal and metal respectively.
C Explain Partition function for Diatomic Molecules