

A-0551

Total Pages : 3

Roll No.

MSCCH-503

M.Sc. CHEMISTRY (MSCCH)

(Physical Chemistry-I)

1st Semester Examination, Session December 2024

Time : 2:00 Hrs.

Max. Marks : 70

Note :- This paper is of Seventy (70) marks divided into Two (02) Sections 'A' and 'B'. Attempt the questions contained in these Sections according to the detailed instructions given therein. *Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.*

Section-A

Long Answer Type Questions 2×19=38

Note :- Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any two (02) questions only.

1. Compare the important features of Maxwell Boltzmann, Bose-Einstein and Fermi- Dirac Statistics.
2. Discuss Debye Huckle theory of mean ionic activity coefficients. Based on the theory, calculate mean ionic activity coefficient of KCl at a molality of 0.02.
3. (a) Define fast reactions. Explain the Flash photolysis method to study the kinetics of such reactions. 9
(b) Discuss kinetics of thermal reaction between hydrogen and bromine. 10
4. Write BET adsorption isotherm. What limiting condition it approximate to Langmuir adsorption isotherm ?
5. Define the term fugacity. How will you determine the fugacity of real gas by graphical method ? State how can it vary with pressure.

Section–B

Short Answer Type Questions 4×8=32

Note :- Section ‘B’ contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. Discuss the primary salt effect on ionic reactions in solution.
2. Discuss the kinetics of pyrolysis of acetaldehyde.
3. Discuss in brief role and importance of statistical mechanics in chemistry.
4. Define the term activity. Explain the determination of activity coefficient by EMF measurements.
5. Calculate the translation partial function two mole of nitrogen at 1 atmosphere pressure 300 K temperature assuming gas behaves to be ideally.
6. Obtain an expression for the relation between partition function and equilibrium constant.
7. Discuss Hinshelwood theory for a unimolecular reaction.
8. What is over voltage and discuss how is it prevented ?
