SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai — 600 044.
M.Sc.(Chemistry) - END SEMESTER EXAMINATIONS APRIL - 2023
SEMESTER - I

22PCHCT1003 - Chemical Kinetics and Thermodynamics

Total Duration : 2 Hrs. 30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Describe collision theory of rate of reaction.
2. Show the variation of chemical potential with respect to temperature and pressure.
3. Derive the relation between partition function and thermo dynamic function.
4. Describe about the relations for rotational partition function.
5. Give a brief note on the rate of an enzyme catalyzed reaction.
6. Derive Gibbs-Duhem equations.
7. Derive and discuss the Debye theory of heat capacities of solids.
8. Explain the Application of Bose-Einstein statistics.

Section C

I - Answer any **TWO** questions $(2 \times 10 = 20$ Marks)

9. Describe the flash photolysis methods for studying kinetics of fast reactions.
10. Discuss the Langmuir - Hinshelwood mechanism for biomolecular surface reactions.
11. a) What is Onsager reciprocal relation?
    b) Prove the Onsager reciprocal relation by the principle of microscopic reversibility.
12. Discuss on partial molar volume and partial molar heat content. Explain its significance.

II - Compulsory question $(1 \times 10 = 10$ Marks)

13. Derive the following:
    a) Sackur-Tetrode equation (5)
    b) Molecular translational partition function (5)

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