

Roll.No.

22UCHCT4007

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.

B.Sc.Chemistry - END SEMESTER EXAMINATIONS - NOVEMBER 2025

SEMESTER - IV

22UCHCT4007 - Thermodynamics

Total Duration : 2 Hrs.30 Mins.

Total Marks : 60

Section B

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

1. Show that for one mole of an ideal gas $C_p - C_v = R$.
2. Derive an expression for Joule-Thomson coefficient $\mu_{J.T}$ and give its significance.
3. Explain Hess's law of constant heat summation and its applications.
4. What is meant by entropy and give its physical significance.
5. Derive the Gibbs-Helmholtz equation.
6. State Lechatelier's principle. Apply this principle for the following reaction.
$$N_{2(g)} + 3H_{(g)} \leftrightarrow 2NH_{3(g)}$$
7. How the absolute entropy of a substance is determined with the help of third law of thermodynamics? Explain.
8. Deduce Sackur- Tetrode equation.

Section C

Answer any **THREE** questions ($3 \times 10 = 30$ Marks)

9. Derive thermodynamic functions ($w, \Delta U$) for reversible and irreversible processes.
10. Discuss the different types of heat of reactions and its applications.
11. Describe in detail the Carnot reversible cycle for establishing the maximum convertibility of heat into work.
12. State thermodynamics of law of chemical equilibrium and show that equilibrium constant is thermodynamic dependent
13. Derive Maxwell-Boltzmann distribution law and discuss the effect of temperature on the distribution.
