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 - APRIL 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. a) State the fundamental postulates of the kinetic theory of gases. (3)
   b) What is the relationship between heat capacities for an ideal gas? (2)
2. Define heat of neutralization and discuss its significance. (3)
   Explain heat of transition with a suitable example. (2)
3. A Carnot engine absorbs 600 J of heat from the hot reservoir at 227° C and rejects heat to a cold reservoir at 27°C K. How much work is done by the engine?
4. a) How is Gibbs free energy related to the equilibrium constant? Give its significance. (3)
   b) State the law of chemical equilibrium. (2)
5. a) Differentiate classical and statistical thermodynamics. (3)
   b) Define the absolute entropy of solids. (2)
6. Assess Hess's law of constant heat summation with a suitable example.
7. a) How do isothermal and adiabatic processes differ in terms of heat exchange, internal energy, work done, and entropy change? (3)
   b) Mention the characteristics of state functions. (2)
8. Arrive at the relation between the partition function and energy.

Section C

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

9. a) Discuss the Joule Thomson coefficient and its significance. (6)
   b) How does enthalpy of a reaction changes with temperature? (4)
10. What is a bomb calorimeter? Describe its working principle and the method for calculating the heat of combustion using it.

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11. a) Examine the following terms: (6)

    i) Chemical potential ii) Fugacity

    b) Describe the Van't Hoff isotherm and mention its importance. (4)

12. Apply Le Chatelier's principle to the formation of ammonia in the Haber process and explain the factors affecting it.

13. a) Deduce the Sackur-Tetrode equation. (7)

    b) Distinguish between microstates and macrostates. (3)

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