

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 - 2024

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. Derive the relationship between  $C_p$  and  $C_v$
2. Discuss Joule Thomson effect.
3. Distinguish endothermic process and exothermic process.
4. State Hess' Law. Explain the heat of combustion.
5. For the reaction  $H_2(g) + \frac{1}{2} O_2(g) \rightarrow H_2O(l)$  The values of enthalpy change and free energy change are  $-68.32$  and  $-56.69$  kcals respectively. Calculate the value of free energy change at  $25^\circ C$ .
6. What is Chemical Potential? Derive Gibb's Duhem equation.
7. Derive the law of mass action for the expression  $n A + m B \rightarrow p C + q D$
8. Explain Planck and Lewis Randall formation of III law.

### Section C

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

9. Deduce kinetic gas equation.
10. Analyze the variation of heat of reaction with temperature.
11. Derive an expression for efficiency of an heat engine using Carnot's cycle.
12. What is Le Chatelier's principle? Discuss its applications.
13. (a) Discuss Nernst heat theorem.  
(b) Write the exceptions of III law of Thermodynamics.

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