CITY COLLEGE
Internal Examination 2021−2022
Physics (Hons.) CBCS Semester 3
Paper: CC6 (Thermal Physics)
Time: 1 Hour; Full Marks: 20

Answer any <u>ten</u> questions from the following: **10×2=20**

1. State and explain the zeroth law of thermodynamics.
2. What do you mean by diathermic and adiabatic wall?
3. Explain what is meant by the term thermodynamic equilibrium.
4. Give the mathematical (differential) form of the first law of thermodynamics. Give the importance of the law.
5. What is enthalpy? Show that enthalpy of a system is given by $H = U + pV$. Is H a state function? Explain.
6. Explain what is meant by 'internal energy' of a system. Is it a state function? Explain.
7. Briefly state the operation of a Carnot's cycle by plotting them in p-V diagram.
8. State and explain the second law of thermodynamics.
9. Define entropy and state briefly its physical significance.
10. State and explain Carnot's theorem.
11. Write down the Maxwell's four thermodynamic relations.
12. Write down the first, second and third T ds equations.
13. What are the first and second order phase transitions? What is a phase diagram and triple point?
14. Starting from the first relation of Maxwell, derive Clapeyron's equation in a skeleton fashion.
15. Define Joule-Thomson co-efficient. Find a relation between inversion, Boyle and critical temperatures.

Answer script must be emailed to **sem3hcityphysics@gmail.com** within 30 minutes of the end of the examination.