D6BPH2001

Reg.No..............................

Name: ....

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2023
(Regular/Improvement/Supplementary)
PHYSICS
GPHY6B10T: THERMODYNAMICS

Time: 2 Hours   **Maximum Marks: 60**

SECTION A: Answer the following questions. Each carries *two* marks.
(Ceiling 20 Marks)

1. What are extensive and intensive variables? Give examples.
2. Show that hydrostatic work is a path function.
3. Write how melting point of ice can be lowered.
4. Define heat capacity. Write down the expression for heat capacity.
5. Define the Quasi-static process.
6. Compare the slopes of adiabatic and isothermals.
7. Give the Kelvin-Planck statement of the Second Law.
8. Draw P-V diagram for Carnot cycle.
9. State Carnot's theorem.
10. At absolute zero, an isotherm and an adiabatic are identical. Justify
11. State the Principle of increase of entropy.
12. What is enthalpy?

SECTION B: Answer the following questions. Each carries *five* marks.
(Ceiling 30 Marks)

13. Discuss work done in an adiabatic process.
14. Explain the idea of heat reservoir. Name the sink when an automobile is running.
15. Show that $C_p - C_v = R$.
16. Derive the equation of state of an ideal gas. Show how it differs for a real gas.
17. With the help of a schematic diagram, explain the working of a refrigerator.
18. A Carnot's engine operates between the temperatures 327°C and 177°C and receives an amount of 1000 calories of heat per cycle. Calculate its efficiency and the work done.
19. Derive two TdS equations

SECTION C: Answer any *one* question. Each carries *ten* marks.

20. Derive the expressions for change in entropy of a perfect gas during a thermodynamic process.
21. Discuss the four Thermodynamic Functions – U, H, A and G. From these functions, develop the Maxwell's Thermodynamic Relations.

$(1 \times 10 = 10 \text{ Marks})$