

2 RS 36183

THREE YEAR B.Sc. (CBCS REVISED) DEGREE EXAMINATION,  
NOVEMBER/DECEMBER 2025.

THIRD SEMESTER

Physics (WM)

Paper III — HEAT AND THERMODYNAMICS (FOR MATHEMATICS COMBINATIONS)

(w.e.f 2023 – 2024 Regulations)

Time : Three hours

Maximum : 75 marks

(No additional sheet will be supplied)

SECTION A — (5 × 5 = 25 marks)

Answer any FIVE questions.

Each question carries 5 marks.

1. State the postulates of kinetic theory of gases.
2. Explain Transport Phenomena.
3. Calculate the efficiency of a reversible heat engine working between 72°C and 187°C.
4. State and Explain the second law of Thermodynamics.
5. Derive an expression for the difference of two specific heats,  $C_p - C_v = R$
6. Explain about Enthalpy.
7. What are the differences between adiabatic expansion and joule – Thomson expansion?
8. Give the applications of low temperature physics.
9. How do you estimate the temperature of sun?
10. Define black body. Explain Fery's black body.

SECTION B — (5 × 10 = 50 marks)

Answer ALL questions.

Each question carries 10 marks.

11. Apply the kinetic theory to obtain an expression for the coefficient of Thermal conductivity.  
Or
12. What are Transport phenomenon in gases? Derive an expression for diffusion of gases on the basis of kinetic theory.

13. Describe the working of Carnot's Engine and define an expression for its efficiency?

Or

14. What is the change in entropy in reversible and irreversible processes?

15. State thermodynamic potentials and derive Maxwell's thermodynamic relations.

Or

16. State and Explain the Joule - Kelvin effect. Derive expression for Joule - Kelvin effect for an Ideal gas and for Vander Waals gas.

17. Describe with theory, How low Temperature are produced by adiabatic demagnetization.

Or

18. Using Linde's method explain about liquefaction of air.

19. What is Black body and define plank's radiation formula?

Or

20. Define solar constant, Describe how a Angstrom's pyro heliometer is used to determine solar constant.

---