

B.Sc. Semester - 4 (NEP-2020) Examination

March/April-2026

PHY: Fundamental Concepts of Thermodynamics (Major-9)

Time: 2:00 Hours

Marks: 50

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

-
- Que.1 Answer any 2 out of 3 following questions. (10)
- (1) Derive Mayer's formula.
 - (2) Discuss specific heats of the gas.
 - (3) Discuss the Porous Plug experiment.
- Que.2 Answer any 2 out of 3 following questions. (10)
- (1) Discuss the concept of Entropy.
 - (2) Discuss the T-S diagram.
 - (3) Show that in a cycle of reversible process, the total change in entropy is always zero.
- Que.3 Answer any 2 out of 3 following questions. (10)
- (1) What is called black body? Explain black body in practice.
 - (2) Explain Wein's displacement law and energy distribution.
 - (3) Describe Planck's law and discuss Wein's law and Rayleigh Jeans law in relation to Planck's law.
- Que.4 Answer any 2 out of 3 following questions. (10)
- (1) Discuss Joule – Thomson effect and Joule – Thomson coefficient.
 - (2) Write the Maxwell's four thermodynamic relations and deduce Clapeyron's latent heat equation.
 - (3) Derive four fundamental Maxwell's thermodynamic relations.
- Que.5 Answer any 5 out of 8 following questions. (10)
- (1) State Carnot's theorem.
 - (2) Define Adiabatic process and Isochoric process.
 - (3) Discuss the principle of increase of entropy.
 - (4) What is entropy? Give the expression and unit for entropy.
 - (5) Write any four properties of thermal radiation.
 - (6) Write Stefan Boltzmann's law and give the value of Stefan's constant in CGS and MKS units.
 - (7) Discuss Enthalpy in brief.
 - (8) Write the TdS equations.
