2024(Backlog)

Time : 3 hours

Full Marks : 75

Pass Marks : 30

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer from both the Groups as directed.

Group – A

1. Answer **all** questions of the following : $1 \times 10 = 10$

   (a) Define specific heat.

   (b) Write a relation between C_p and C_v.

   (c) What is a reversible process ?

   (d) Define entropy.

   (e) Define mean free path.

(f) State third law of thermodynamics.

(g) What are thermodynamical potentials ?

(h) What is boson ?

(i) What is white radiation ?

(j) Why does the colour of a body appear to change on heating ?

2. Explain entropy temperature diagrams. 5

Group – B

Answer any **four** questions of the following : 15×4 = 60

3. (a) What do you mean by isothermal process and adiabatic process ?

(b) Deduce work done during isothermal process and adiabatic process.

4. State and explain first law of thermodynamics. Discuss the application of first law of thermodynamics to various processes.

5. State the law of equipartition of energy. Apply it to deduce molar specific heats of a gas. Also give the expression for specific heats of a monoatomic gas.

6. Derive Planck's law and use it to deduce Wein's distribution law.

7. Stating the basic postulates, derive an expression for Bose-Einstein distribution law.

8. Write short notes on any **two** of the following :

(a) The transport phenomenon viscosity

(b) Unattainsability of absolute zero

(c) Spectral distribution of energy of a black body radiation

(d) State and explain second law of thermodynamics.