LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **PHYSICS**

FIFTH SEMESTER – **NOVEMBER 2024**

16UPH5MC02 – THERMAL PHYSICS

Date: 11-11-2024 Dept. No. Max. : 100 Marks

Time: 09:00 am-12:00 pm

SECTION A

Answer ANY FOUR of the following **4 x 10 = 40 Marks**

1. Discuss about Kinetic interpretation of temperature.
2. Obtain Van der Waal's equation of state.
3. Obtain the enthalpy form of the first law of thermodynamics.
4. A heat engine receives 100 Kcal of heat from a source at 1000 K. It rejects 50 Kcal, 75 Kcal and 25 Kcal of heat to the surrounding at 500 K. Investigate the nature of change in each case.
5. Deduce the expression for entropy change in an irreversible process.
6. Write a short note on the principle of increase in entropy.
7. Obtain the expression for thermodynamic relations involving heat capacities.
8. Draw the thermodynamic mnemonic diagram and hence obtain Maxwell's thermodynamic relations.

SECTION B

Answer ANY THREE of the following **3 x 20 = 60 Marks**

9. Derive expression for Maxwell's distribution of velocity for an ideal gas.
10. Using First order approximation, obtain the expression for mean free path and collision frequency.
11. Discuss the theory of Carnot's cycle and hence obtain the expression for efficiency of Carnot's cycle.
12. Obtain the expression for equation of state of adiabatic transformation and hence deduce lapse rate equation.
13. Derive the TdS equations.
14. Obtain Clausius - Clapeyron latent heat equation.

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