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(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2024-25 ONLY)

SUBJECT CODE 24 UPS 202

REG.NO.

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS : MAY– 2025

B.Sc. – PHYSICS **MAXIMUM MARKS: 75**

II SEMESTER **TIME : 3 HOURS**

PART – III

THERMAL PHYSICS

SECTION – A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS. (K1)

1. A Monoatomic gas molecule has -------degrees of freedom.

   (a) one (b) two (c) zero (d) three

2. Thermal Diffusivity is defined as the ratio of thermal conductivity to thermal capacity per unit-------.

   (a) density (b) volume (c) mass (d) weight

3. Hydrogen cannot be liquefied by Cascade process because of its Critical-------.

   (a) temperature (b) pressure (c) speed (d) velocity

4 .------- law of thermodynamics helps us to define the term temperature of a system..

   .(a) First (b) Second (c) Zeroth (d) Third

5. At absolute zero temperature, the Entropy tends to---------.

   (a) unity (b) zero (c) one (d) critical

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES. (K2)

6. State Dulong and Petit's Law.

7. Distinguish between Conduction and Convection.

8. What is called the Absolute zero temperature?

9. Give the mathematical equation for the First law of Thermodynamics.

10. What is Entropy?

SECTION – B (5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)

11. (a) Define and get equations for Critical Constants.

(OR)

(b) State the Postulates of Kinetic Theory of Gases.

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12. (a) List any five properties of Thermal Radiations.

(OR)

(b) Explain Lee's Disc method of determining thermal conductivity of a bad conductor.

13. (a) Describe Linde's process of Liquefaction of Air.

(OR)

(b) Write a note on Helium-I and Helium-II.

14. (a) Compare Heat and Work.

(OR)

(b) Write a note on Irreversible Process.

15. (a) Discuss the Entropy of a Perfect Gas.

(OR)

(b) Give an account of change in Entropy in a Reversible process.

SECTION – C (5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

(K4/K5)

16. (a) (i) Derive Gas Equation
(ii) Discuss the concept of Ideal or Perfect Gas.

(OR)

(b) Write a note on (i) Maxwell's law of distribution of Velocities. (3)
(ii) How can you verify it experimentally? (5)

17. (a) Describe the Forbe's method for finding the coefficient of Thermal conductivity of a metal Bar.

(OR)

(b) .(i) State Stefan's Law. (2)
(ii) Give the Lab method for determining the Stefan's constant. (6)

18. (a) Explain about the Porous-Plug experiment.

(OR)

(b) Describe with necessary theory of method of producing very low temperature by Adiabatic Demagnetization.

19 (a). Discuss the (i) Isochoric and (ii Isobaric process.

(OR)

(b) State and prove Carnot's Theorem.

20. (a) Obtain Maxwell's Thermo-dynamical relations.

(OR)

(b) Explain in detail the Helmholtz function.

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