(6 pages) **Reg. No. :** .....

Code No. : 20347 E **Sub. Code : EMPH 21**

B.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2025

Second Semester

Physics – Core

HEAT THERMODYNAMICS AND STATISTICAL PHYSICS

(For those who joined in July 2023 only)

Time : Three hours Maximum : 75 marks

PART A — (1 × 10 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Meyers relation is _____

(a) Cp Cv=y (b) Cp Cv=R

(c) Cp Cv (d) Cp Cv

2. Linde's process obeys _____

(a) Joule kelvin effect

(b) Ramans effect

(c) Joule effect

(d) Porous plug process

3. Zeroth law involves _____

(a) Ten (b) Nine

(c) Three (d) Four

4. Entropy is measure of _____

(a) degree of heat (b) degree of cold

(c) degree of quantity (d) degree of disorder

5. Efficiency of idea heat engine is:

(a) One (b) Ten

(c) Four (d) Three

6. The clausius - clayperon equation is _____ latent heat equation.

(a) Third (b) First

(c) Fourth (d) Second

7. Dose radiation requires what?

(a) Medium

(b) No medium

(c) Vaccum

(d) Vaccum and medium

8. Stefen's law is :

(a) $E = T^2$ (b) $E = \sigma T^4$

(c) $E = \sigma T^4$ (d) $E = \sigma T^3$

9. How many thermodynamic statistical distribution are there

(a) One (b) Two

(c) Four (d) Three

10. Two types of states in thermodynamical.

(a) Micro and Macro (b) Micro and Mini

(c) Macro and Big (d) Macro and Small

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Derive Meyers relation of gases.

Or

(b) Explain porous plug experiment.

12. (a) Discuss briefly P-V diagram.

Or

(b) Write short notes on comparison of engines.

13. (a) Derive maxwell's thermodynamic relation.

Or

(b) Explain clasius -clayperon latent heat equation and third of thermodynamics.

14. (a) Explain in detail about determination of thermal conductivity for poor conduction.

Or

(b) Elaborate about distribution of energy in black body radiation.

15. (a) Discuss about Fermi - Dirac statistics.

Or

(b) Derive maxwell - Boltzmann statistics.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain in detail about regnaull's method for determination of cp.

Or

(b) Write elaborately about liquefaction of gas by linde's process.

17. (a) Explain heat engine and its efficiency.

Or

(b) Explain Carnot's engine and its cycle with a diagram.

18. (a) Explain entropy change in reversible and inreversible.

Or

(b) Explain T-S diagram.

19. (a) Briefly explain about conduction, convection and radiation.

Or

(b) Explain Forbes method of determination of thermal conductivity for good conductors.

20. (a) Discuss about Bose - Einstein statistics.

Or

(b) Discuss about types of ensembles.

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