24I104 (Pages: 2) Name: .....

Reg.No: .....

FIRST SEMESTER M.Sc. INTEGRATED GEOLOGY DEGREE EXAMINATION, NOV. 2024

(CBCSS)

(Regular/Supplementary/Improvement)

CC23 PHY1 IC01 - PROPERTIES OF MATTER AND THERMODYNAMICS

(Physics - Core Course)

(2023 Admission onwards)

Time : 2.00 Hours Maximum : 60 Marks

Credit : 2

Part A (Short answer questions)

Answer ***all*** questions. Each question carries 2 marks.

1. What is plasticity?
2. Write down the expressionfor the bending moment of a beam.Explain the symbols.
3. Explain why hot water is a better cleaning agent?
4. A few drops of benzene and water are placed on titled surface. Which of these liquids have a better flow. (Viscsoity of benzene is 0.564×10^{-3} and for water, it is 0.801×10^{-3}).
5. Write down the expression for Poiseuille's equation ? Identify the terms in the equation.
6. Write down the Stoke's law for the motion of body in a viscous medium?
7. How does the viscosity of a gas depeneds on its pressure?
8. Explain quasistatic process.
9. Find the expression for work done during adiabatic process.
10. Give any two statements of second law of thermodynamics.
11. Mention the name of thermodynamic process involved in carnot engine.
12. State principle of increase of entropy.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer ***all*** questions. Each question carries 5 marks.

13. Derive the expression for the time period of the torsion pendulum.
14. Write a note on brownian motion. Explain its significance.
15. Explain thermodynamic equilibrium.
16. A tyre pumped to a pressure of 3atm suddenly bursts. Calculate the fall in temperature due to adiabatic expansion.Initial temperature is 27degree celcius. Y=1.4

17. Efficiency of a Carnot's cycle changes from 1/6 to 1/3 when source temperature is raised by 100K. Calculate the temperature of the sink.

18. Explain change in entropy in irreversible cycle.

19. Using Clausius Clpeyron equation explain the effect of melting point solid and boiling point of a liquid.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any ***one*** question. The question carries 10 marks.

20. Explain the term surface energy. How is it related to surface tension? Derive an expression for excess pressure inside a spherical bubble.

21. What is entropy? Write its physical significance. Prove that the entropy of a system increases in an irriversible process.

(1 × 10 = 10 Marks)

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