

24U120S

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Name: .....

Reg.No: .....

**FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2024**

(CBCSS - UG)

**CC20U PHY1 C01 - PROPERTIES OF MATTER AND THERMODYNAMICS**

(Physics - Complementary Course)

(2020 to 2023 Admissions - Supplementary/Improvement)

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 elastic after effect?
2. What is Poissons Ratio?
3. Give any two everyday examples involving surface tension.
4. What is the energy required to split a larger drop of radius R into two smaller drops?
5. Define coefficient of viscosity. Write its unit.
6. Write down the expression for Poiseuille's equation. Identify the terms in the equation.
7. Define thermodynamic system.
8. Explain isothermal and isochoric process.
9. Explain the significance of first law of thermodynamics.
10. Mention the name of thermodynamic process involved in carnot engine.
11. State Carnot's theorem.
12. Explain the change in entropy in a carnot cycle.

**(Ceiling: 20 Marks)**

**Part B (Short essay questions - Paragraph)**

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

13. Calculate the couple required to twist one end of a wire of length 1 m and radius 1.5 mm through an angle 45 degree by keeping the other end fixed given  $n = 5 \times 10^{10} \text{ Nm}^{-2}$
14. What are the assumptions of pure bending?
15. Write a note on brownian motion. Explain its significance.
16. Write a note on the viscosity of gases. Contrast it with viscosity of liquids.
17. Calculate the work done when one gram molecule of an ideal gas expands isothermally at 27 °C to double its original volume.  $R = 8.3 \text{ J/K mol}$ .

18. Explain Carnot engine. Give expression for efficiency of carnot engine.
19. Calculate the change in entropy of 5Kg water at 100 degree celsius when changes into vapour.

**(Ceiling: 30 Marks)**

**Part C** (Essay questions)

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

20. How will you determine the viscosity of a liquid by Stoke's method.
21. Write Clausius-Clayperon equation. Explain the effect of pressure on the boiling point of liquids and melting point of liquids on the basis of this equation.

**(1 × 10 = 10 Marks)**

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