

D 53687

(Pages : 2)

Name.....

Reg. No.....

**FIRST SEMESTER (CBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2023**

Physics

PHY 1C 01—PROPERTIES OF MATTER AND THERMODYNAMICS

(2019—2023 Admissions)

Time : Two Hours

Maximum : 60 Marks

The symbols used in this question paper have their usual meanings.

Section A (Short Answer Type)

*Answer **all** questions in two **or** three sentences.*

Each correct answer carries a maximum of 2 marks.

1. Write down the units of :
 - (i) Stress.
 - (ii) Strain.
 - (iii) Modulus of Elasticity.
2. Define rigidity modulus of elasticity
3. What is a torsion pendulum ?
4. What is meant by entropy ?
5. What is thermodynamic system ?
6. What are thermodynamic co-ordinates ?
7. Define co-efficient of viscosity.
8. Explain terminal velocity.
9. Write down Stokes law and explain the symbols used.
10. Mention three applications of Stokes law.
11. What is Isobaric process ?
12. State Carnot's theorem.

(Ceiling 20)

Turn over

Section B (Paragraph / Problem Type)

Answer **all** questions in **a paragraph** of about **half a page to full page**.

Each correct answer carries a maximum of 5 marks.

13. Define isobaric process with equation.
14. Derive the equation for work done in a torsion pendulum.
15. Derive an expression for the period oscillation of a torsion pendulum.
16. A steel tap is stretched so that its length is 0.001 % of its initial line. If $Y = 200 \text{ GPa}$, Calculate the stress required.
17. a) What is isothermal process ?
b) Calculate the work done in compressing 2 mole of an ideal gas kept at a constant temperature of 20°C from a volume of 4 litre to 1 litre.
18. Derive the equation for work done by a hydrostatic system.
19. Show that the work done by a hydrostatic system in an adiabatic process is $W = nR(T_f - T_i)$.

(Ceiling - 30)

Section C (Essay Type)

Essays.

Answer in about **two pages**, any **one** question.

Answer carries 10 marks.

20. Define Viscosity. Derive the Poiseuille's equation for the rate of flow of a liquid through a capillary tube.
21. Define adiabatic and isothermal bulk modulus of elasticity. Show that adiabatic bulk modulus of elasticity of a perfect gas is γ times its isothermal bulk modulus of elasticity.

(1 × 10 = 10 marks)