

D 13612

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Name.....

Reg. No.....

FIRST SEMESTER (CBCSS—UG) DEGREE EXAMINATION, NOVEMBER 2021

Physics/Applied Physics

PHY 1C 01—PROPERTIES OF MATTER AND THERMODYNAMICS

(2019 to 2020 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. Define young's modulus of elasticity.
2. Derive the theoretical limits of Poisson's ratio.
3. What is stress ? What is its unit ?
4. What is surface tension ?
5. Explain the terms Neutral surface and Neutral axis.
6. What is a torsion pendulum ?
7. Explain the concept of heat and temperature.
8. State first law thermodynamics.
9. What do you mean by isothermal elasticity ?
10. What is a refrigerator ?
11. What is its coefficient of performance ?
12. Why thermodynamic temperature is called the absolute temperature ?

(Ceiling 20)

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. The excess of pressure inside a soap bubble of radius 1 mm is equal to balance a liquid column of height 2.09 cm. Calculate the density of the liquid. Given surface tension of soap solution is 0.04N/m.
14. Calculate the work done in blowing a bubble.

Turn over

15. Derive an expression for the excess pressure inside a spherical drop.
16. Show that the isothermal bulk modulus of elasticity of a perfect gas is P .
17. State and explain Kelvin-Planck statement of second law of thermodynamics.
18. Write and prove Carnot's theorem.
19. Write down Stokes law and explain the symbols used. Mention three applications of Stokes law.

(Ceiling 30)

Section C (Essay Type)

Answer in about two pages, any one question.

Answer carries 10 marks.

20. Define coefficient of viscosity. Describe Poiseuille's method to determine it.
21. What is a T-S diagram? Draw T-S diagrams for reversible isothermal, reversible adiabatic, reversible isochoric and reversible isobaric.

(1 × 10 = 10 marks)