22U113 (Pages: 2) Name: .....

Reg.No: .....

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2022

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19U PHY1 C01 / CC20U PHY1 C01 - PROPERTIES OF MATTER AND THERMODYNAMICS

(Physics - Complementary Course)

(2019 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 are the theoretical limits of Poissons Ratio?
2. What are the drawbacks of torsion pendulum?
3. Define the terms neutral surface and neutral axis?
4. Explain the spherical shape of water surface using concept of surface energy?
5. How does the sign of electric charge affect the electrostatic pressure of a bubble?
6. Differentiate between a streamline flow and a turbulent flow of a liquid.
7. Explain thermal equilibrium and chemical equilibrium.
8. Explain adiabatic process with indicator diagram.
9. Explain isochoric process based on first law of thermodynamics.
10. Briefly explain Carnot's engine.
11. Explain the change in entropy during free expansion
12. Give Clausius Clapeyorn equation. Explain the terms.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. A spherical ball contracts in volume by 0.1 %, when subjected to a normal uniform pressure of 100 atm.Calculate the bulk modulus of the material of the ball(1 atm = 100 N/m(2))
14. Write a note on Brownian motion. Explain its significance.
15. Write a note on the viscosity of gases. Contrast it with viscosity of liquids.

16. Derive the expression for work done in isothermal process.

17. Explain Carnot engine. Give expression for efficiency of Carnot engine.

18. A Carnot's engine absorbs 104 calories of heat from a reservoir at 627 degree Celsius and rejects heat to a sink at 27 degree Celsius. What is its efficiency? How much work does it perform (in joule)?

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. Each question carries 5 marks.

20. How will you determine the viscosity of a liquid by Stoke's method?

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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