D1BPH2302 (PAGES 2) **Reg.No.....**

Name: .....

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2023

(Regular/Improvement/Supplementary)

PHYSICS: COMPLEMENTARY COURSE FOR MATHEMATICS & CHEMISTRY

GPHY1C01T: PROPERTIES OF MATTER AND THERMODYNAMICS

Time: 2 Hours **Maximum Marks: 60**

SECTION A: Answer the following questions. Each carries *two* marks.

(Ceiling 20 Marks)

1. State Hooke's law of Elasticity.
2. What is bending moment?
3. What are the theoretical limits of Poisson's ratio? Explain.
4. Explain the term terminal velocity.
5. Define coefficient of velocity.
6. Explain the effect of pressure and temperature on the viscosity of gases.
7. How can we explain the pressure difference of a curved surface?
8. Briefly explain the terms molecular range and sphere of influence.
9. State first law of thermodynamics. Give mathematical form of first law of thermodynamics.
10. What is principle of increase of entropy?
11. A thermos bottle containing coffee is vigorously shaken. What happens to its internal energy?
12. What is Clausius – Clapeyron latent heat equation?

SECTION B: Answer the following questions. Each carries *five* marks.

(Ceiling 30 Marks)

13. What is elasticity? Find the Young's modulus of the material of wire of length 5 meter and 1 mm diameter, which is stretched by 0.3 mm when a load o 1.25 Kg is applied?
14. Derive Stoke's formula for the velocity of a small sphere falling through a viscous fluid.
15. Calculate work done in blowing a bubble. Calculate the loss of energy if 1,000 drops of water having 2 mm diameter coalesce to form one large drop? Surface tension of water is 0.07 N/M.
16. What is an isobaric process? An ideal diatomic gas is heated at isobaric condition. The quantity of heat given to it is 280 Joules. Calculate the work done by the gas? Ratio of specific heats ' γ ' equal to 1.4.

(PTO)

17. What is thermal efficiency? The efficiency of a Carnot's engine working between two temperatures is 0.5. If on increasing the temperature of the sink by 100^0C, the efficiency becomes 0.25. Find temperature of the source and sink?
18. Derive an expression for work done during an adiabatic process.
19. What is entropy? Calculate change in entropy when 500 gms of water at 350 K is converted in to steam at 373K. Specific Latent heat of steam is 2260 J/gm, Specific heat of water 4.184 J/gm.

SECTION C: Answer any *one* question. Each carries *ten* marks.

20. What is a Torsion pendulum? Describe with necessary theory the experimental determination of rigidity modulus of elasticity by Torsion pendulum arrangement?
21. State and prove Carnots theorem.

(1 x 10 = 10 Marks)