22102151

QP CODE: 22102151

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) REGULAR / IMPROVEMENT / REAPPEARANCE EXAMINATIONS, JULY 2022

First Semester

Complementary Course - PH1CMT02 - PHYSICS - PROPERTIES OF MATTER AND THERMODYNAMICS

(Common to B.Sc Chemistry Model I, B.Sc Geology Model I)

2017 Admission Onwards

D2132AB5

Time: 3 Hours

Max. Marks : 60

Part A

*Answer any **ten** questions.*

*Each question carries **1** mark.*

1. Distinguish stress from strain.
2. What do you mean by torsional couple?
3. Explain the term flexural rigidity.
4. Why the beams used in construction of bridges have a cross-section shape of the letter I?
5. What is surface energy?
6. What is the effect of impurities on surface tension?
7. Distinguish between stream line flow and turbulent flow of liquid.
8. Mention the cause of Brownian motion.
9. Explain thermodynamic system and surroundings.
10. State Zeroth law of thermodynamics?
11. Obtain the relation connecting the coefficient of performance and efficiency of a Carnot's refrigerator.
12. Explain the term Entropy.

(10×1=10)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. A wire 2 m long and radius 0.2 mm is stretched by weight of 4 kg. The extension produced in the length of the wire is 0.4 mm. What is the Young's modulus of the material?

14. In shafts, do you prefer hollow cylinder over solid? Explain with necessary theory.

15. At a certain point in a horizontal pipeline the water speed is 2.50 m/s and the gauge pressure is 1.80×10^4 Pa. Find the gauge pressure at a second point in the pipe if the cross sectional area at the point is twice that at the first.

16. Derive Stokes formula for the velocity of a small sphere falling through a liquid.

17. Explain Bernoulli's theorem.

18. One moleof hydrogen at $23^{O}C$ is isothermally expanded until its pressure reduces to $1/4^{th}$ of its initial value. Calculate the work done.

19. Derive an expression for the work done during an adiabatic process.

20. Define efficiency of a Carnot's engine. Derive the expression for the efficiency of a Carnot's engine.

21. When 100g of water is heated from $10^{O}C$ to $80^{O}C$, by how much does its entropy change?

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **10** marks.*

22. What you do understand by Young's modulus if the material? Derive the expression for the depression at the free end of the cantilever heavily loaded at free end.

23. Distinguish between uniform and non-uniform bending. Deduce the relation for depression at the middle of a uniform beam supported between two knife edges and loaded at the middle.

24. Obtain an expression for the excess pressure inside a liquid drop and a bubble.

25. Derive Maxwell's thermodynamical relations. Give its Physical Significance.

(2×10=20)