23104643

QP CODE: 23104643

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) REGULAR/IMPROVEMENT/REAPPEARANCE EXAMINATIONS, FEBRUARY 2023

First Semester

Complementary Course - PH1CMT01 - PHYSICS-PROPERTIES OF MATTER & ERROR ANALYSIS

(Common to B.Sc Mathematics Model I, B.Sc Statistics Model I)

2017 Admission Onwards

AB11EE8A

Time: 3 Hours Max. Marks : 60

Part A

*Answer any **ten** questions.*

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

1. What is volume strain?
2. What do you mean Young's modulus of a material?
3. What do you mean by bending couple?
4. Why are tiny liquid drops spherical in shape?
5. What is the expression for excess pressure inside a liquid drop?
6. Write any two advantages of surface tension.
7. What do you mean by Brownian motion?
8. Why uncertainities are always added?
9. What are random errors?
10. What is absolute error?
11. What do you mean by standard deviation?
12. Let q=xyz . Find the fractional uncertainity in q.

(10×1=10)

Part B

*Answer any **six** questions.*

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

13. Two cylinders of same length, mass and density but one solid of radius r and the other hollow of inner and outer radii r_1 and r_2 respectively. Which one requires more couple to twist through same angle? Explain.

14. The thickness of an iron plate is 0.75c m. A hole of radius 1.5 cm is to be drilled on the plate. The shear stress is 288×10^5 kg/m^2. Find the force needed to make the hole.

15. Explain the static torsion method to find the rigidity modulus of a metal rod.

16. Distinguish between streamline flow and turbulent flow.

17. Describe Stokes method to determine viscosity of a liquid.

18. Explain the importance of estimationg errors. In an experiment to find the rigidity modulus of a material of a wire. a student reports erros as 5%in I, 7% in R, 10% in T and 20% in r. How much would be the error in reporting the rigidity modulus? The equation used is \ (n=4*\pi* IMR^2/T^2r^2 \)

19. Give two examples of instrumental errors that commonly found in your physics lab and explain how it can be eliminated.

20. The length, breadth and thickness of a metal block are 4,234m, 1.005m and 2.01cm. Its mass is 601.2 kg. Find its density to correct significant figures.

21. . A physical quantity x is calculated from the relation $x=a^3b^2/\sqrt{}$ (cd).Calculate the percentage error in x if a, b, c, d are measured respectively with an error of 1%, 3%, 4%and 2%.

(6×5=30)

Part C

*Answer any **two** questions.*

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

22. 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.

23. Derive Poiseuille's formula for the streamline flow of a liquid through a capillary tube. What are the corrections to be applied to Poiseuille's formula?

24. Derive Bernoulli's equation for streamline flow of a liquid. Modify the relation for the flow of a liquid through a horizontal pipe of varying cross section.

25. Discuss how errors propagate in sum, difference, product, division and powers of physical quantities.

(2×10=20)