23145808

QP CODE: 23145808

Reg No : .....

Name : .....

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

7267F87B

Time: 3 Hours Max. Marks : 60

Part A

*Answer any **ten** questions.*

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

1. What do you understand by the term elastic limit of a material?
2. Explain the term bending moment.
3. What are I section girders?
4. Why are tiny liquid drops spherical in shape?
5. Distinguish between stream line flow and turbulent flow of liquid.
6. Give an expression for the energy possessed by a flowing liquid.
7. Explain Bernoulli's equation.
8. What is mean by precision in measurements?
9. What is systematic error?
10. The radius of the sphere is measured with an error of 2%. What would be the percentage of error in its volume?
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. Find the greatest length of a steel wire that can hang vertically without breaking. Breaking stress for steel is 7.7×10^{10} N/m^2. Density of steel is 7700 kg/m^3.
14. Derive an expression for torsional rigidity of a cylindrical material.
15. 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.
16. Derive equation of continuity for the flow of an incompressible fluid.
17. Derive Bernoulli's equation for the streamline flow of a liquid.
18. Distinguish between precision and accuracy in measurements. What are the important sources of errors that may occure while doing a measurement?
19. 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 $n = 4 * \pi * IMR^2 / T^2 r^2$
20. What do you mean by significant figures? What are the important rules to determine the number of significant figures?
21. A capacitor of capacitance C= (3.0 ± 0.1) μf is connected across a potential difference V of (2 ± 0.2) V. Calculate the charge Q with error limits. (C=Q/V)

(6×5=30)

Part C

*Answer any **two** questions.*

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

22. What do you mean by Rigidity modulus of the material? Explain with necessary theory how rigidity modulus of material, taken in the form of a rod, can be determined using static torsion apparatus.
23. Obtain an expression for the excess pressure inside a liquid drop and a bubble.
24. Obtain the Poiseuilli's equation for the volume of liquid flowing through a pipe.
25. a) Discuss the various types of errors in measurement.
    b) Explain the need for calibration of an instrument. Discuss some metods for calibration.

(2×10=20)