B.Sc. DEGREE EXAMINATION,NOVEMBER 2018
I Year I Semester
Core Major - Paper I
PROPERTIES OF MATTER

Time : 3 Hours **Max.marks :60**

Section A $(10 \times 1 = 10)$ Marks

Answer any **TEN** questions

1. Write down the expression for mass and density of earth.
2. State Kepler's laws of planetary motion.
3. Write the dimensional formula of modulus of elasticity.
4. Define bulk modulus.
5. Which type of modulus is involved under torsion?
6. Write down the expression for work done in twisting a wire.
7. Name the types of molecular forces.
8. Write down the expression for excess of pressure inside a soap bubble.
9. Give the unit of coefficient of viscosity.
10. Give the expression for critical velocity.
11. Give the dimensions of gravitational constant.
12. Mention any two applications of viscosity.

Section B $(5 \times 4 = 20)$ Marks

Answer any **FIVE** questions

13. State and explain Newton's laws of gravitation.
14. Define the following terms: i) Poisson's ratio. ii) Cantilever.
15. Derive an expression for the period of oscillation of a torsional pendulum.
16. Define surface tension. Give its unit, dimensions, and applications.
17. Distinguish between streamline flow and turbulent flow.
18. Decribe Jaegar's method of finding surface tension of a liquid.
19. Show that E $= \frac{9GK}{3K+G}$.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. Derive an expression for the gravitational potential due to a uniform sphere at a point (i) inside the sphere and (ii) outside the sphere.
21. What is meant by a beam? Obtain an expression for bending moment.
22. Derive an expression for twisting couple on a cylinder.
23. Obtain an expression for excess of pressure over curved surfaces.
24. Derive Poiseuille's formula for the rate of flow of a liquid through a capillary tube.

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