SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN (AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai — 600 044.
B.Sc. END SEMESTER EXAMINATIONS APRIL-2022
SEMESTER - I
20UPHCT1001 - Properties of Matter

Total Duration : 3 Hrs. **Total Marks : 60**

Section A

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Describe Boy's method to determine the gravitational constant.
2. Derive an expression for bending moment.
3. Explain torsional oscillations and hence establish the relation, T=$2\pi\sqrt{\left(\frac{I}{c}\right)}$.
4. Discuss the pressure difference across a liquid surface and hence obtain an expression for the excess of pressure inside a spherical soap bubble.
5. How can the viscosities of two liquids be compared using Ostwald's Viscometer?
6. Use kinetic theory to explain the surface tension of a liquid.
7. Briefly explain the Cavendish's experiment for the determination of the universal constant G.
8. Write a note on friction and lubrication. Give some properties of a good lubricant.

Section B

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Derive an expression for the gravitational potential due to a uniform sphere at a point,
   (i) inside the sphere and (ii) outside the sphere.
10. Deduce the relations connecting the three moduli of elasticity.
11. What is torsion in a body? Derive the expression for torque per unit twist for a solid and hollow cylinder.
12. Explain Jaegar's method of determining the variation of surface tension with temperature.
13. With necessary theory describe Poiseuille's method of determination of viscosity of a liquid.

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