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 NOVEMBER-2022
SEMESTER - III
20UCHAT3003 - Allied Physics I

Total Duration : 2 Hrs 30 Mins. **Total Marks : 60**

Section A

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

1. Explain the uses of Lissajous figures.
2. Intrepret the difference between Streamline flow and turbulent flow.
3. Derive the Vander Waals equation of state applying correction for pressure.
4. Show that when two charged conductors share their charge, there is always a loss of energy.
5. Relate Bulk modulus , Rigidity Modulus and Poisson's ratio.
6. A spherical bubble of radius 0.001m is blown in an atmosphere whose pressure is 10^5 Nm^{-2}. If the Surface Tension of the liquid comprising the film is 0.05 Nm^{-1}, to what pressure must the surrounding atmosphere be brought in order that the radius of the bubble may be doubled?
7. Explain how ultrasonics are produced in a magnetostriction oscillator.
8. The capacitance of a parallel plate capacitor is 400 pico farad and its plates are separated by 2 mm of air.
   (i) What will be the energy when it is charged to 1500 volts?
   (ii) What will be the potential difference with same charge if plate separation is doubled?
   (iii) How much energy is needed to double the distance between its plates?

Section B

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

9. Compute the composition of two simple harmonic motion of Equal time periods at right angles.
10. Apply the torsion pendulum method of finding the rigidity modulus of a wire. Deduce the formula employed.

Contd...

11. Derive the expression for poiseuille's formula with necessary theory.
12. Discuss the various applications of ultrasonic waves.
13. Infer on the basics of Biot savart's law. Deduce the expression for magnetic induction due to current in a circular coil of wire at a point on its axis.

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