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.(Chemistry) - END SEMESTER EXAMINATIONS APRIL-2023
SEMESTER - III
20UCHAT3003 - Allied Physics - I

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

Section B

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

1. Define simple harmonic motion. Explain all the parameters involved in the equation representing simple Harmonic motion y=a sin(ωt-α).Also derive differential equation for simple harmonic motion
2. State and explain the molecular theory of surface tension. Also give the uses of surface tension.
3. Predict the postulates of kinetic theory of gases. The Vander waals constants for hydrogen are a=2.45 $\times 10^{-2}$ Nm^4/mole^2 and b=2.67$\times 10^{-5}$4 m^3/mole. Calculate temperature of inversion, critical temperature and Boyle's temperature.
4. Derive an expression for the field along the axis of a circular coil carrying current.
5. Determine the rigidity modulus of the material of the rod experimentally using static torsion apparatus.
6. Apply the burette method to compare the viscosities of two liquids.
7. Explain some of the applications of Ultrasonic waves medicine and industry.
8. Determine the loss of energy when two capacitors of capacitance 1 μf and 2 μf which are charged to potentials of 100 and 200 V respectively when they share their charges.

Section C

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

9. Obtain an expression for composition of two simple harmonic motions at right angles to each other. Also explain them graphically.
10. Give the theory and method of determining the rigidity modulus of a Wire using torsional pendulum.
11. Derive Poiseuille's formula. Describe an experiment to determine the coefficient of viscosity of a liquid.

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12. What are Ultrasonics? Explain any one method of production of Ultrasonic wave, with a neat circuit diagram.
13. Describe the principle of a potentiometer. Use it to calibrate the low range voltmeter and draw the calibration graph.

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