

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.(Maths) END SEMESTER EXAMINATIONS NOVEMBER -2023

SEMESTER - I

22UMAAT1D01 - Allied Physics - I

Total Duration : 2 Hrs 30 Mins.

Total Marks : 60

Section B

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

1. What are Lissajous figures? Show how they may be produced and demonstrated.
2. Show that (i) $E = 2G(1 + \nu)$ and (ii) $E = 9GK/(3k + G)$ where E , G and K are different moduli of elasticity
3. Derive an expression for torque per unit twist of wire length L and radius a .
4. Define viscosity. Explain how do you compare viscosities of two liquids.
5. Explain the drop-weight method experiment to determine the surface tension of a liquid.
6. State and explain the laws of transverse vibrations in stretched strings.
7. Derive the relationship between electric field and electric potential.
8. Calculate the total magnetic induction at a point on the axis of a circular coil carrying current.

Section C

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

9. Find the resultant of two S.H.M.'s of equal period when they act at right angles to one another. Discuss the different important cases.
10. Explain with necessary theory an experiment to determine the Young's modulus of the material by non- uniform bending.
11. Derive Poiseuille's formula for the rate of flow of liquid through the capillary tube.
12. Define ultrasonics. Explain how they are produced by piezoelectric method. Give an account of their applications.
13. Elaborate the theory of potentiometer. How do you use it to calibrate low range voltmeter?
