



B.K. BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
A CBSE DAY-CUM-BOYS' RESIDENTIAL SCHOOL



PRE MID-TERM EXAMINATION

PHYSICS (042)

Class: XII

SET-1

Time: 1hr

Date: 21.07.26

Max Marks: 25

Admission no:

Roll no:

General Instructions:

- (i) There are three sections A, B, and C with 13 questions in total, Section A has 5 Multiple Choice Questions of one mark each, Section B has 4 questions of two marks each and Section C has 4 questions of three marks each.
- (ii) All questions are compulsory.
- (iii) Calculators are not allowed.

Section A (1 Mark each)

1. A soft iron core is inserted inside a solenoid carrying current. The magnetic field inside the solenoid:
(a) decreases (b) remains same (c) increases many times (d) becomes zero
2. The SI unit of magnetic susceptibility is:
(a) Henry (b) Weber (c) Dimensionless (d) Tesla
3. The induced emf in a coil is maximum when the rate of change of magnetic flux is:
(a) minimum (b) zero (c) constant (d) maximum
4. The flux linked with a coil is given by: $\Phi = 5t^3 - 6t^2 + 4$. Wb
The induced emf at $t = 2$ s is:
(a) -48 V (b) -36 V (c) -40 V (d) -24 V

5. Assertion-Reason

Assertion: A diamagnetic substance moves from stronger field to weaker field.

Reason: Diamagnetic substances have negative susceptibility.

- (a) Both correct and Reason explains Assertion
- (b) Both correct but Reason does not explain Assertion
- (c) Assertion correct, Reason incorrect
- (d) Both incorrect

Section B (2 Marks each)

6. State two factors affecting self-inductance of a coil.
7. Distinguish between ferromagnetic and paramagnetic materials.

8. A rod of length 0.4 m moves with speed 5 m/s perpendicular to magnetic field 0.2 T. Find induced emf.
9. A material has susceptibility $+3.2 \times 10^{-4}$. Identify it and write two properties.

Section C (3 Marks each)

10. State Faraday's laws of electromagnetic induction.
11. Derive expression for motional emf in a conductor moving in magnetic field.
12. Explain the working of transformer stating the principle, construction and application.
13. A circular coil of radius R carrying current I have N turns. It is converted into a square coil of same wire length. Find ratio of magnetic moments.

-----BEST OF LUCK-----