



INTERMEDIATE

Magnetic Property and Method

Hand Notes For JEE Mains, Advance, NEET UG, Class 11 & 12 etc...

Hand Notes

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MAGNETIC PROPERTY AND METHOD

Magnetic Field (H) → It is applied magnetic field for magnetising of ordinary material rod.

* Vector.

* Unit → Amp/m

Intensity of Magnetisation (I) →

* It is Induced Magnetic Moment per unit Volume of Rod.

or,
Induced pole strength per unit cross-sectional Area.

$$I = \frac{M_{\text{induced}}}{\text{Volume}}$$

$$I = \frac{M_{\text{ind}}}{\text{vol}} = \frac{M_{\text{ind}}}{A}$$

* Vector

* Unit → Amp/meter

AIIMS

Magnetic susceptibility (χ) →

Tendency.

* It represent how easily a material can be magnetised.

$$\chi = \frac{I}{H}$$

* unit & dimension less.

$$I = \chi H$$

H → Ext. Mag. field.

Magnetic Permeability (μ) →

* It Represent how many line of force are allowed to pass through a material.

$$\mu_0 = 4\pi \times 10^{-7} \frac{\text{Henry}}{\text{m}} \text{ (MKS)}$$

$$\mu = \mu_0 \mu_r$$

* Best ($\mu_r = 2000$) of soft Iron.

* Due to high permeability external magnetic field can't enter in cavity of soft Iron box so soft Iron box are used for magnetic shielding.

NOTE → * Electric & magnetic shielding are possible but gravitational shielding is never possible.

$$\begin{aligned} I &= \frac{M_{\text{induced}}}{\text{vol.}} \\ I &= \chi H \\ \mu_r &= 1 + \chi \\ \mu &= \mu_0 \mu_r \end{aligned}$$

$$1 \text{ oersted} = 80 \text{ A/m}$$

* Relative permeability of air → 1.04

[A → soft Iron is used as transformer core.
R → soft Iron has narrow Hysteresis loop.

Ans → (A)