Physics Formula Sheet

Chapter by chapter, topic by topic. Written by the PadhoNa team for quick revision.

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CHAPTER 22

Magnetic Properties of Matter

Bar magnet and Earth's magnetism

$$B_{\text{axial}} = \frac{\mu_0}{4\pi}\frac{2M}{r^3}, \qquad B_{\text{equatorial}} = \frac{\mu_0}{4\pi}\frac{M}{r^3}$$

EARTH

$$B_H = B\cos\delta, \qquad B_V = B\sin\delta, \qquad \tan\delta = \frac{B_V}{B_H}$$

OSCILLATION MAGNETOMETER

$$T = 2\pi\sqrt{\frac{I}{MB_H}}$$

Magnetic materials

$$B = \mu_0(H + M), \qquad \chi = \frac{M}{H}, \qquad \mu_r = 1 + \chi$$

CURIE'S LAW

$$\chi \propto \frac{1}{T}\ (\text{paramagnets}); \qquad \chi = \frac{C}{T - T_c}\ (\text{ferromagnets above } T_c)$$

CLASSIFICATION

$$\text{dia: } \chi < 0\ (\text{small}); \qquad \text{para: } \chi > 0\ (\text{small}); \qquad \text{ferro: } \chi \gg 1$$

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