



## Ch—05 Magnetism and Matter

### Daily Practice Problem 04

**Q1.** A magnet weighs 75 g and its magnetic moment is  $2 \times 10^{-4} \text{ Am}^2$ . If the density of the material of the magnet is  $7.5 \times 10^3 \text{ kg m}^{-3}$ , calculate the intensity of magnetization.

**Q2.** Obtain the earth's magnetisation. Assume that the earth's field can be approximated by a giant bar magnet of magnetic moment  $8.0 \times 10^{22} \text{ Am}^2$ . The earth's radius is 6400 km.

**Q3.** A solenoid of 500 turns/m is carrying a current of 3 A. Its core is made of iron which has a relative permeability of 5000. Determine the magnitudes of the magnetic intensity, magnetisation and the magnetic field inside the core.

**Q4.** The absolute magnetic permeability is measured to be  $0.12 \text{ T A}^{-1} \text{ m}$ . Find its relative permeability and susceptibility.

**Q5.** A magnetizing field of 1500 A/m produces a magnetic flux of  $2.4 \times 10^{-5} \text{ Wb}$  in a bar of iron of cross-section  $0.5 \text{ cm}^2$ . Calculate permeability and susceptibility of iron bar used.

**Q6.** The magnetizing field of  $1600 \text{ A m}^{-1}$  produces a magnetic flux of  $2.4 \times 10^{-5} \text{ weber}$  in a bar of iron of cross-section  $0.2 \text{ cm}^2$ . Calculate relative permeability, intensity of magnetization and susceptibility of the bar.

**Q7.** An iron rod of volume  $10^{-4} \text{ m}^3$  and relative permeability 1000 is placed inside a -long solenoid wound with 5 turns per cm. If a current of 0.5 A is passed throw; the solenoid, find the magnetic moment of the rod.

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**ANSWERS**

1.  $20 \text{ A/m}$

2.  $73 \text{ A/m}$

3.  $1500 \text{ Am}^{-1}$ ;

$7.5 \times 10^6 \text{ Am}^{-1}$ ;  $9.4 \text{ T}$

4.  $9.55 \times 10^4$ ;  $9.55 \times 10^4$

5.  $3.2 \times 10^{-4} \frac{\text{Tm}}{\text{A}}$ ;  $254$

6.  $596.8$ ;  $9.534 \times 10^{-1}$ ;

$595.8$

7.  $25 \text{ Am}^2$