ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

SOLUTION TO WORK SHEET 26

Subject : PHYSICS

01.7.20

CLASS : XII

Topic : μ, μ_r; Dia, Para and Ferro magnetic material, comparison, magnetisation vector, χ, $\mu_0 = (I + \chi)$

Chapter : Magnetic properties of materials

Multiple Choice Question : **1 x 15 = 15**

1. Which one of the following is ferromagnetic?
   (a) Aluminium (b) Nickel (c) Gold (d) Copper Ans. (b) Nickel

2. Which are is paramagnetic?
   (a) Antimony (b) Silver (c) Marbel (d) Alnico Ans. (a) Antimony

3. Which one is not the unit of magnetic induction vector?
   (a) T (b) Wb m^{-2} (c) $JA^{-1}m^{-2}$ (d) $NA^{-1}m^{-1}$ Ans. (d) $NA^{-1}m^{-1}$

4. Which one is not the unit of intensity of magnetisation?
   (a) Am^{-1} (b) $JT^{-1}m^{-3}$ (c) $NT^{-1}m^{-2}$ (d) $AT^{-1}m^{-2}$ Ans. (d) $AT^{-1}m^{-2}$

5. Which of the following relation is not correct?
   (a) $B = \mu_0(H + I)$ (b) $B = \mu_0 H(I + \chi)$ (c) $I = \frac{B - \mu_0 H}{\mu_0}$ (d) $\chi = \mu - I$
   Ans. (d) $\chi = \mu - I$

6. Name the material for which magnetic susceptibility is high and positive?
   (a) Ferromagnetic (b) Paramagnetic (c) Diamagnetic (d) Non-magnetic
   Ans. (a) Ferromagnetic

7. Relative permeability of iron is 1000, its absolute permeability in SI unit is
   (a) $4\pi \times 10^{-4} TmA^{-1}$ (b) $4\pi \times 10^{-3} TmA^{-1}$ (c) $\frac{400}{\pi} TmA^{-1}$ (d) $\frac{4 \times 10^9}{\pi} TmA^{-1}$
   Ans. (a) $4\pi \times 10^{-4} TmA^{-1}$

8. A magnetising force of 360 Am^{-1} produces a magnetic flux density of 0.6T in a ferromagnetic material. The susceptibility of the material is —
   (a) 1625 (b) 1326 (c) 2105 (d) 1914
   Ans. (b) 1326

9. In the case of diamagnetic material
   (a) $\mu_r > 1, \lambda_m > 1$ (b) $\mu_r > 1, \chi_m < 1$ (c) $\mu_r < 1, \lambda_m < 0$ (d) $\mu_r < 1, \chi_m > 1$
   Ans. (c) $\mu_r < 1, \lambda_m < 0$

10. Relative permeability of iron is 5500. Its magnetic susceptibility is
    (a) 5500 x 10^7 (b) 5499 (c) 5501 (d) 5500 x 10^7
    Ans. (b) 5499

11. A material when placed in a magnetic field is thrown out of it. Then the material is
(a) paramagnetic (b) diamagnetic (c) ferromagnetic (d) non-magnetic
Ans. (b) diamagnetic

12. While entering a paramagnetic material from air, the spacing between the magnetic lines of force
(a) remains the same (b) decreases (c) increases
(d) first increases then decreases Ans. (b) decreases

13. The magnetic susceptibility of a diamagnetic material is
(a) nearly 1000 (b) slightly greater than 1
(c) in between 0 and 1 (d) less than 0
Ans. (d) less than 0

14. Curie temperature is the temperature above which
(a) ferromagnetic material becomes paramagnetic
(b) ferromagnetic material becomes diamagnetic
(c) paramagnetic material becomes diamagnetic
(d) paramagnetic material becomes ferromagnetic
Ans. ((a) ferromagnetic material becomes paramagnetic

15. There are four light-weight-rod samples *A, B, C, D* separately suspended by threads. A bar magnet is slowly brought near each sample and the following observations are noted
(i) *A* is feebly repelled (ii) *B* is feebly attracted
(iii) *C* is strongly attracted (iv) *D* remains unaffected

Which one of the following is true?
(a) *B* is of a paramagnetic material (b) *C* is of a diaamagnetic material
(c) *D* is of a ferromagnetic material (d) *A* is of a non-magnetic material
Ans. (a) *B* is of a paramagnetic material

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