

Magnetism-2

- Two identical bar magnets each having magnetic moment of 'M' are kept at a distance of  $2d$  with their axes perpendicular to each other in a horizontal plane. The magnetic induction midway between them is  
(A)  $\frac{\mu_0}{4\pi} \cdot (\sqrt{2}) \frac{M}{d^3}$  (B)  $\frac{\mu_0}{4\pi} \cdot (\sqrt{3}) \frac{M}{d^3}$  (C)  $\frac{\mu_0}{4\pi} \cdot \frac{M}{d^3}$  (D)  $\frac{\mu_0}{4\pi} \cdot (\sqrt{5}) \frac{M}{d^3}$
- A bar magnet is placed with its North pole pointing North. Neutral point is at a distance 'd' from the center of magnet. The net magnetic induction at the same distance on the axial line of the magnet.  
(A)  $2B_H$  (B)  $3B_H$  (C)  $B_H$  (D)  $7B_H$
- At a temperature of  $30^\circ\text{C}$ , the susceptibility of ferromagnetic material is found to be 'x'. Its susceptibility at  $333^\circ\text{C}$  is  
(A)  $X$  (B)  $\frac{X}{2}$  (C)  $2X$  (D)  $11.1X$
- The magnetic susceptibility of a rod is 499. The absolute permeability of vacuum is  $4\pi \times 10^{-7}$  H/m. The absolute permeability of the material of the rod is  
(A)  $\pi \times 10^{-4}$  H/m (B)  $2\pi \times 10^{-4}$  H/m (C)  $3\pi \times 10^{-4}$  H/m (D)  $4\pi \times 10^{-4}$  H/m
- If  $\delta_1$  and  $\delta_2$  be the angles of dip observed in two vertical planes at right angles to each other and  $\delta$  is the true value of dip then  
(A)  $\tan^2 \delta = \tan^2 \delta_1 + \tan^2 \delta_2$  (B)  $\cot^2 \delta = \cot^2 \delta_1 + \cot^2 \delta_2$   
(C)  $\tan^2 \delta = \frac{\tan^2 \delta_1 + \tan^2 \delta_2}{\tan^2 \delta_1 + \tan^2 \delta_2}$  (D)  $\cot^2 \delta = 1 + \cot^2 \delta_1 \cos^2 \delta_2$
- The coercivity of a small magnet where the ferromagnet gets demagnetized is  $3 \times 10^3 \text{ Am}^{-1}$ . The current required to be passed in a solenoid of length 10cm and number of turns 100, so that the magnet gets demagnetized when inside the solenoid, is :  
(A) 3A (B) 6A (C) 30 mA (D) 60 mA
- Needles  $N_1$ ,  $N_2$  and  $N_3$  are made up of ferromagnetic, paramagnetic and diamagnetic substances respectively. A magnet when brought close to them will  
(A) attract  $N_1$  and  $N_2$  strongly but repel  $N_3$ .  
(B) attract  $N_1$  strongly,  $N_2$  weakly and repel  $N_3$  weakly.  
(C) attract  $N_1$  strongly, but repel  $N_2$  and  $N_3$  weakly.  
(D) attract all three of them.
- If a magnet is suspended at an angle of  $30^\circ$  to the magnetic meridian, the dip needle makes an angle of  $45^\circ$  with the horizontal. The real dip is  
(A)  $\tan^{-1}(\sqrt{3}/2)$  (B)  $\tan^{-1}(\sqrt{3})$  (C)  $\tan^{-1}(\sqrt{3}/2)$  (D)  $\tan^{-1}(2/\sqrt{3})$

9. A bar magnet is held perpendicular to a uniform field. If the couple acting on the magnet is to be halved by rotating it from above position, the angle by which it is to be rotated is  
 (A)  $30^\circ$  (B)  $60^\circ$  (C)  $40^\circ$  (D)  $90^\circ$
10. Force between two identical short bar magnets whose centres are  $r$  metre apart is  $8.1 \text{ N}$ , when their axis or along the same line. If separation is increased to  $3r$  and the axis are rearranged perpendicularly, the force between them would become  
 (A)  $2.4 \text{ N}$  (B)  $1.2 \text{ N}$  (C)  $0.1 \text{ N}$  (D)  $0.05 \text{ N}$
11. Two magnets are held together in a vibration magnetometer and are allowed to oscillate in the earth's magnetic field with like poles together. 12 oscillations per minute are made but for unlike poles together, only 4 oscillations per minute are executed. The ratio of their magnetic moments is  
 (A)  $3 : 1$  (B)  $1 : 3$  (C)  $3 : 5$  (D)  $5 : 4$
12. A bar magnet suspended by a horse hair lies in the magnetic meridian when there is no twist in the hair. On turning the upper end of the hair through  $150^\circ$ , the magnet is deflected through  $30^\circ$  from the meridian. Then the angle through which the upper end of the hair has to be twisted to deflect the magnet through  $90^\circ$  from the meridian is  
 (A)  $150^\circ$  (B)  $330^\circ$  (C)  $360^\circ$  (D)  $450^\circ$
13. A susceptibility of a certain magnetic material is 400. What is the class of the magnetic material?  
 (A) Ferromagnetic (B) Diamagnetic (C) Ferroelectric (D) Paramagnetic
14. The incorrect statement regarding the lines of force of the magnetic field  $B$  is  
 (A) magnetic intensity is measure of lines of force passing through unit area held normal to it.  
 (B) magnetic lines of force from a close curve.  
 (C) inside a magnet, its magnetic lines of force move from north pole of a magnetic towards its south pole.  
 (D) The magnetic lines of force never, cut each other.
15. The dipole moment of short bar magnet is  $12.5 \text{ A-m}^2$ . The magnetic field on its axis at a distance of  $0.5\text{m}$  from the centre of the magnet  
 (A)  $1.0 \times 10^{-4} \text{ N/A-m}$  (B)  $4 \times 10^{-2} \text{ N/A-m}$   
 (C)  $2 \times 10^{-6} \text{ N/A-m}$  (D)  $6.64 \times 10^{-8} \text{ N/A-m}$



Physics Worksheet-16						Magnetism-2						06-02-2019		
1-D	2-B	3-B	4-B	5-B	6-A	7-B	8-C	9-B	10-D	11-D	12-B	13-A	14-C	15-C