LAKSHYA (JEE)

Magnetism and Matter

DPP-04

1. At a place, the horizontal and vertical intensities of earth's magnetic field is 0.30 Gauss and 0.173 Gauss respectively. The angle of dip at this place is
(A) 30° (B) 90°
(C) 60° (D) 45°

2. The angle of dip at a place is 60°. At this place the total intensity of earth's magnetic field is 0.64 units. The horizontal intensity of earth's magnetic field at this place is
(A) 1.28 units (B) 0.64 units
(C) 0.16 units (D) 0.32 units

3. A very small magnet is placed in the magnetic meridian with its south pole pointing north. The null point is obtained 20 cm away from the centre of the magnet. If the earth's magnetic field (horizontal component) at this point be 0.3 Gauss, the magnetic moment of the magnet is
(A) 8.0×10^2 e.m.u. (B) 1.2×10^3 e.m.u.
(C) 2.4×10^3 e.m.u. (D) 3.6×10^3 e.m.u.

4. If the angles of dip at two places are 30° and 45° respectively, then the ratio of horizontal components of earth's magnetic field at the two places will be
(A) $\sqrt{3} : \sqrt{2}$ (B) $1 : \sqrt{2}$
(C) $1 : \sqrt{3}$ (D) 1 : 2

5. The value of the horizontal component of the earth's magnetic field and angle of dip are 1.8×10^{-5} Weber/m^2 and 30° respectively at some place. The total intensity of earth's magnetic field at that place will be
(A) 2.08×10^{-5} Weber/m^2
(B) 3.67×10^{-5} Weber/m^2
(C) 3.18×10^{-5} Weber/m^2
(D) 5.0×10^{-5} Weber/m^2

6. The real angle of dip, if a magnet is suspended at an angle of 30° to the magnetic meridian and the dip needle makes an angle of 45° with horizontal, is :
(A) $\tan^{-1}\left(\frac{\sqrt{3}}{2}\right)$ (B) $\tan^{-1}(\sqrt{3})$
(C) $\tan^{-1}\left(\frac{\sqrt{3}}{\sqrt{2}}\right)$ (D) $\tan^{-1}\left(\frac{2}{\sqrt{3}}\right)$

7. The values of the apparent angles of dip in two planes at right angles to each other are 30° and 45°. Then the true value of the angle of dip at the place is
(A) $\tan^{-1} 1$ (B) $\tan^{-1} 2$
(C) $\cot^{-1} 2$ (D) $\cot^{-1} 1$

8. A dip circle lies initially in the magnetic meridian. If it is now rotated through angle θ in the horizontal plane, then tangent of the angle of dip is changed in the ratio :
(A) 1 : cos θ (B) cos θ : 1
(C) 1 : sin θ (D) sin θ : 1

9. At a certain place the angle of dip is 30° and horizontal component of earth's field is 0.5 Oersted, the earth's total magnetic field in Oersted is :
(A) $\sqrt{3}$ (B) 1
(C) $\frac{1}{\sqrt{3}}$ (D) $\frac{1}{2}$

10. A current carrying coil is placed with its axis perpendicular to *N*-*S* direction. Let horizontal component of earth's magnetic field be H_0 and magnetic field inside the loop is H. If a magnet is suspended inside the loop, it makes angle θ with H. Then θ =
(A) $\tan^{-1}\left(\frac{H_0}{H}\right)$ (B) $\tan^{-1}\left(\frac{H}{H_0}\right)$
(C) $\text{cosec}^{-1}\left(\frac{H}{H_0}\right)$ (D) $\cot^{-1}\left(\frac{H_0}{H}\right)$

ANSWER KEY

1. **(A)**
2. **(D)**
3. **(B)**
4. **(A)**
5. **(A)**
6. **(A)**
7. **(C)**
8. **(A)**
9. **(C)**
10. **(A)**