



Ch—05 Magnetism and Matter

Daily Practice Problem 03

Q1. The horizontal and vertical components of earth's field at a place are 0.22 G and 0.38 G respectively. Calculate the angle of dip and resultant intensity of Earth's field

Q2. A ship is sailing due west according to Mariner's compass. If the declination of the place is 15° east of north, what is the true direction of the ship?

Q3. A ship is sailing due east according to Mariner's compass. If the declination of the place is 18° east of north, what is the true direction of the ship? (Ans. 18° south of east)

Q4. The horizontal component of earth's magnetic field is 0.2 G and total magnetic field is 0.4 G. Find angle of dip.

Q5. A compass needle whose magnetic moment is 60 Am^2 pointing geographical north at a certain place, where the horizontal

component of earth's magnetic field is $40 \mu\text{T}$, experiences a torque of $1.2 \times 10^{-3} \text{ Nm}$. What is the declination at that place?

Q6. A vertical wire in which current is flowing produces a neutral point with the earth's horizontal field at a distance of 5 cm from the wire in air. What is current, if $B_H = 0.18 \times 10^{-4} \text{ T}$?

Q7. A short bar magnet of magnetic moment 0.5 J T^{-1} is placed with its magnetic axis in the magnetic meridian, with its north pole pointing geographical north. A neutral point is obtained at a distance of 0.1 m from the centre of the magnet. Find the horizontal component of the earth's magnetic field.

Q8. A neutral point is found on the axis of a bar magnet at a distance of 10 cm from its one end. If the length of the magnet be 10 cm and $B_H = 0.3 \text{ G}$, find the magnetic moment of the magnet.

ANSWERS

1. 60° ; $B = 0.44 \text{ G}$

2. 75° west of north

3. 18° south of west

4. 60°

5. 30°

6. 4.5 A

7. 10^{-4} T

8. 0.012 Am^2