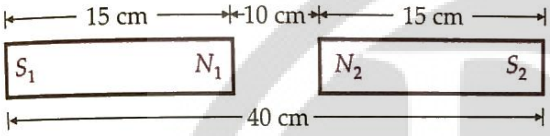
Ch—05 Magnetism and Matter

Daily Practice Problem 01

Q1. Calculate the force acting between two magnets of length 15 cm each and pole strength 80 Am each when the separation between their north poles is 10 cm and that between south poles is 40 cm.

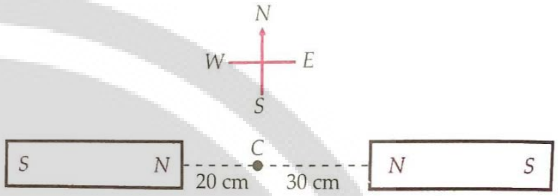


Q2. A magnetized steel wire 31.4 cm long has a pole strength of 0.2 Am. It is bent in the form of a semicircle. Calculate the magnetic moment of the steel wire.

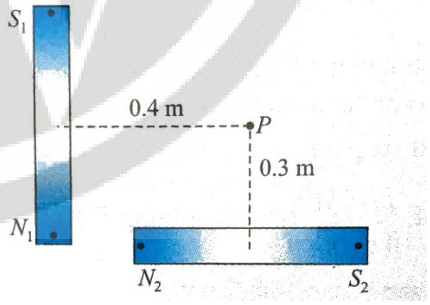
Q3. Two magnetic poles, one of which is 10 times as strong as the other, exert on each other a force equal to 9.604 mN, when placed 10 cm apart in air. Find the strength of the two poles.

Q4. Two like magnetic poles of strength 25 Am and 64 Am are situated 1.0 m apart in air. At what point on the line, joining the two poles the magnetic field will be zero?

Q5. Two small magnets are placed horizontally, perpendicular to the magnetic meridian. Their north poles are at 30 cm east and 20 cm west from a compass needle. If the compass needle remains undeflected, compare the magnetic moments of the magnets.



Q6. Two short bar magnets N_1S_1 and N_2S_2 of magnetic moments $32Am^2$ and $27AM^2$ are placed on the table as shown in figure. Find the magnitude and direction of the magnetic fields produced by these magnets at point P located on equatorial lines of both the magnets at distances of 0.4 m and 0.3 m respectively from their centers.



Q7. What is the magnitude of the equatorial and axial fields due to a bar magnet of length 5 cm at a distance of 50 cm from the midpoint? The magnetic moment of the bar magnet is 0.40 Am^2.

ANSWERS

1. 0.048 N

2. 0.04 Am^2

3. 9.8 Am; 98 Am

4. 0.385 m from pole of 25 Am (towards 64 Am)

5. 8:27

6. $1.12 \times 10^{-4} T$

$\theta = \tan^{-1} 2$

7. $B_{eq} = 3.2 \times 10^{-7} T$

$B_{axial} = 6.4 \times 10^{-7}\ T$