LAKSHYA (JEE)

Magnetism and Matter

DPP-01

1. The effective length of a magnet is 31.4 cm and its pole strength is 0.5 Am. The magnetic moment, if it is bent in the form of a semicircle will be

(A) 0.1 Am^2 (B) 0.01 Am^2

(C) 0.2 Am^2 (D) 1.2 Am^2

2. Two similar bar magnets P and Q, each of magnetic moment M, are taken. If P is cut along its axial line and Q is cut along its equatorial line, all the four pieces obtained have

(A) Equal pole strength

(B) Magnetic moment $\frac{M}{4}$

(C) Magnetic moment $\frac{M}{2}$

(D) Magnetic moment M

3. A magnetic needle is placed on a cork floating in a still lake in the northern hemisphere. Does the needle together with the cork move towards the north of the lake

(A) Yes

(B) No

(C) May be or may not be move

(D) Nothing can be said

4. A magnet of magnetic moment M and pole strength m is divided in two equal parts, then magnetic moment of each part will be

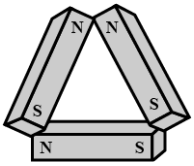
(A) M

(B) $M/2$

(C) $M/4$

(D) $2M$

5. Three identical bar magnets each of magnetic moment M are placed in the form of an equilateral triangle as shown

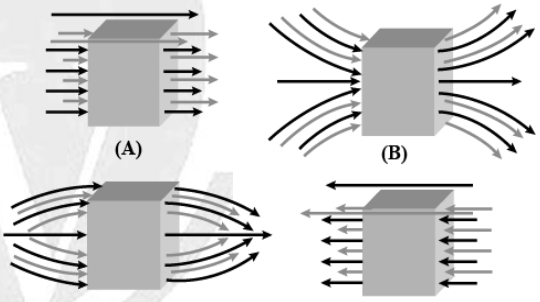


The net magnetic moment of the system is

(A) Zero (B) $2M$

(C) $M\sqrt{3}$ (D) $3M/2$

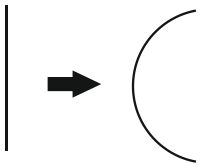
6. A uniform magnetic field, parallel to the plane of the paper existed in space initially directed from left to right. When a bar of soft iron is placed in the field parallel to it, the lines of force passing through it will be represented by



(A) Figure (A) (B) Figure (B)

(C) Figure (C) (D) Figure (D)

7. A magnetised wire of moment M is bent into an arc of a circle subtending an angle of 60° at the centre. The new magnetic moment is



(A) $(2M/\pi)$ (B) (M/π)

(C) $(3\sqrt{3}\,M/\pi)$ (D) $(3M/\pi)$

8. A bar magnet when placed at an angle of 30° to the direction of magnetic field induction of 5×10^{-2} T, experiences a moment of couple 25×10^{-6} N-m. If the length of the magnet is 5 cm its pole strength is

(A) 2×10^{-2} A-m (B) 5×10^{-2} A-m

(C) 2 A-m (D) 5 A-m

9. A magnet of magnetic moment $50\hat{i}$ A-m^2 is placed along the *x*-axis in a magnetic field $\vec{B} = (0.5\hat{i} + 3.0\hat{j})$ T. The torque acting on the magnet is

(A) 175 $\hat{k}$ N-m (B) 150 $\hat{k}$ N-m

(C) 75 $\hat{k}$ N-m (D) $25\sqrt{37}\ \hat{k}$ N-m

10. A bar magnet is held perpendicular to a uniform magnetic field. If the couple acting on the magnet is to be halved by rotating it, then the angle by which it is to be rotated is

(A) 30° (B) 45°

(C) 60° (D) 90°

ANSWER KEY

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

Note - If you have any query/issue

Mail us at support@physicswallah.org