LAKSHYA (JEE)

Magnetism and Matter

DPP-03

1. A small coil of N turns has an effective area A and carries a current I. It is suspendered in a horizontal magnetic field $\vec{B}$ such that its plane is perpendicular to $\vec{B}$. The work done in rotating it by 180° about the vertical axis is
   (A) $NAIB$
   (B) $2\,NAIB$
   (C) $2\pi\,NAIB$
   (D) $4\pi\,NAIB$

2. A circular coil of radius 4 cm has 50 turns. In this coil a current of 2 A is flowing. It is placed in a magnetic field of 0.1 Weber/m². The amount of work done in rotating it through 180° from its equilibrium position will be
   (A) 0.1 J
   (B) 0.2 J
   (C) 0.4 J
   (D) 0.8 J

3. A circular loop of area 1 cm², carrying a current of 10 A, is placed in a magnetic field of 0.1 T perpendicular to the plane of the loop. The torque on the loop due to the magnetic field is
   (A) zero
   (B) 10^{-4} Nm
   (C) 10^{-2} Nm
   (D) 1 Nm

4. The magnetic moment of a current carrying loop is 2.1×10^{-25} amp × m². The magnetic field at a point on its axis at a distance of 1 Å is
   (A) 4.2×10^{-2} weber/m²
   (B) 4.2×10^{-3} weber/m²
   (C) 4.2×10^{-4} weber/m²
   (D) 4.2×10^{-5} weber/m²

5. Two identical thin bar magnets each of length l and pole strength m are placed at right angle to each other with north pole of one touching south pole of the other. Magnetic moment of the system is
   (A) ml
   (B) $2\,ml$
   (C) $\sqrt{2}\,ml$
   (D) $\dfrac{1}{2}\,ml$

6. The magnetic field due to a short magnet at a point on its axis at distance X cm from the middle point of the magnet is 200 Gauss. The magnetic field at a point on the neutral axis at a distance X cm from the middle of the magnet is
   (A) 100 Gauss
   (B) 400 Gauss
   (C) 50 Gauss
   (D) 200 Gauss

7. Two like magnetic poles of strength 10 and 40 SI units are separated by a distance 30 cm. The intensity of magnetic field is zero on the line joining them
   (A) At a point 10 cm from the stronger pole
   (B) At a point 20 cm from the stronger pole
   (C) At the mid-point
   (D) At infinity

8. Point A and B are situated along the extended axis of 2 cm long bar magnet at a distance x and $2x$ cm respectively. From the pole nearer to the points, the ratio of the magnetic field at A and B will be
   (A) 4 : 1 exactly
   (B) 4 : 1 approx.
   (C) 8 : 1 exactly
   (D) 8 : 1 approx.

9. Ratio of magnetic intensities for an axial point and a point on broad side-on position at equal distance d from the centre of magnet will be or. The magnetic field at a distance d from a short bar magnet in longitudinal and transverse position are in the ratio
   (A) 1 : 1
   (B) 2 : 3
   (C) 2 : 1
   (D) 3 : 2

10. The work done in rotating a magnet of magnetic moment 2 A-m² in a magnetic field of 5×10^{-3} T from the direction along the magnetic field to opposite direction to the magnetic field, is
    (A) zero
    (B) 2×10^{-2} J
    (C) 10^{-2} J
    (D) 10 J

ANSWER KEY

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

Note – If you have any query/issue

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