BYJU'S Study Planner for Board Term I
(CBSE Grade 12)

Date: 19/11/2021

Subject: Physics

Topic : Magnetism and Matter Class: Standard XII

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1. A neutral point is obtained at the centre of a vertical circular current carrying coil. The angle between the plane of the coil and the magnetic meridian is

   A. 0°

   B. 45°

   C. 60°

   D. 90°

2. As we go from the magnetic equator towards the geographical south pole, the angle of the dip will become :

   A. More and more vertically downward and perpendicular to the surface at the magnetic south pole.

   B. More and more vertically upward and becomes perpendicular to the surface at the magnetic south pole.

   C. Less and less vertically downward and become horizontal at the magnetic south pole.

   D. Lesser and lesser vertically upward and become horizontal at the magnetic south pole.

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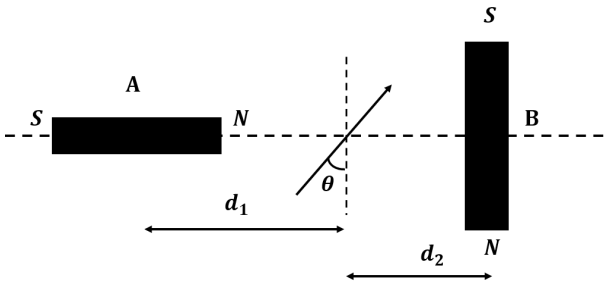
3. Two short bar magnets A and B are identical and these are arranged as shown in the figure. A magnetic needle is placed between the magnets at point P which gets deflected through an angle θ under the influence of magnets. The ratio of distances d_1 and d_2 will be.



A. $\dfrac{1}{\sqrt[3]{2\tan\theta}}$

B. $\dfrac{1}{\sqrt[3]{2\cot\theta}}$

C. $\sqrt[3]{2\cot\theta}$

D. $\sqrt[3]{2\tan\theta}$

4. A magnetising field of $5000\ \mathrm{A/m}$ produces a magnetic flux of $5\times10^{-5}\ \mathrm{wb}$ in an iron rod is $0.5\ \mathrm{cm}^2$, then the permeability of the rod will be (in $\mathrm{H/m}$)

A. 2×10^{-4}

B. 1×10^{-3}

C. 4×10^{-6}

D. 3×10^{-5}

5. A magnet is suspended at an angle 60° in an uniform external magnetic field of 5×10^{-4} T. The work done in bringing the magnet in the direction of the magnetic field is (The magnetic moment $= 20\ \mathrm{Am}^2$)

   A. -5×10^{-3} T

   B. $+5 \times 10^{-3}$ T

   C. -3×10^{-3} T

   D. $+3 \times 10^{-3}$ T

6. Read the two statements carefully to mark the correct option out of the options given below:

   Statement -1: The tangent galvanometer can be made more sensitive by increasing the number of turns of its coil.

   Statement -2: Current through the galvanometer is proportional to the number of turns of the coil.

   A. Both the statements are true, and the statement-2 is the correct explanation of statement-1.

   B. Both statements are true, but the statement-2 is not the correct explanation of the statement-1.

   C. The statement-1 true but statement-2 is false.

   D. The statement-1 is false, but statement-2 is true.

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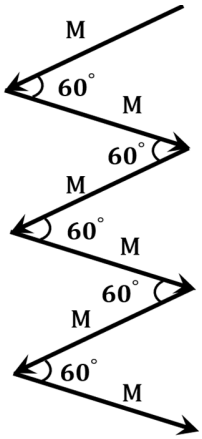
7. The resultant magnetic moment of the following arrangement is-



A. $6M$

B. $4M$

C. $3M$

D. $2M$

8. A bar magnet of length $10\ \text{cm}$ and pole strength $2\ \text{Am}$ makes an angle 60° with a uniform magnetic field of induction $B = 50\ \text{T}$. The couple acting on it is-

A. $20\sqrt{3}\ \text{Nm}$

B. $10\sqrt{3}\ \text{Nm}$

C. $\sqrt{3}\ \text{Nm}$

D. $5\sqrt{3}\ \text{Nm}$

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9. The magnetic susceptibility of a rod is 499. The absolute permeability of vacuum is $\mu_0 = 4\pi \times 10^{-7}\ \mathrm{Hm}^{-1}$. The absolute permeability of the material of the rod is-

   A. $4\pi \times 10^{-4}\ \mathrm{Hm}^{-1}$

   B. $3\pi \times 10^{-4}\ \mathrm{Hm}^{-1}$

   C. $2\pi \times 10^{-4}\ \mathrm{Hm}^{-1}$

   D. $\pi \times 10^{-4}\ \mathrm{Hm}^{-1}$

10. A short bar magnet placed with its axis at 30° with a uniform external magnetic field of $0.16\ \mathrm{T}$, experiences a torque of $0.032\ \mathrm{Nm}$. If the bar magnet is free to rotate, its potential energy when it is in stable and unstable equilibrium are-

    A. $0.032\ \mathrm{J}\ ;\ -0.032\ \mathrm{J}$

    B. $0.064\ \mathrm{J}\ ;\ -0.128\ \mathrm{J}$

    C. $-0.032\ \mathrm{J}\ ;\ 0.032\ \mathrm{J}$

    D. $-0.064\ \mathrm{J}\ ;\ 0.064\ \mathrm{J}$

11. Choose the incorrect statement about the magnetic properties of soft iron and steel

    A. Retentivity of soft iron is more than retentivity of steel

    B. Coercivity of soft iron is less than coercivity of steel

    C. Area of $B-H$ loop in soft iron is smaller than the area of $B-H$ loop for steel

    D. Area of $B-H$ loop in soft iron is greater than the area of $B-H$ loop for steel

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12. Assertion (A) : Electromagnets are made of soft iron.

    Reason (R) : Coerctivity of soft iron is small.

    A. Both (A) and (R) are true, (R) is the correct explanation of (A)

    B. Both (A) and (R) are true, (R) is not the correct explanation of (A)

    C. (A) is true but (R) is false.

    D. (A) is false but (R) is true.

13. A short bar magnet of moment $4\ \mathrm{Am}^2$ is placed in the magnetic merdian with its south-pole pointing geographic north. The distance between two null points is found to be $20\ \mathrm{cm}$.

    (i)The value of horizontal component of the earth's magnetic field at the place is

    A. $4 \times 10^{-4}\ \mathrm{T}$

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

    C. $8 \times 10^{-4}\ \mathrm{T}$

    D. $10 \times 10^{-4}\ \mathrm{T}$

14. A short bar magnet of moment $4\ \mathrm{Am}^2$ is placed in the magnetic merdian with its south-pole pointing geographic north. The distance between two null points is found to be $20\ \mathrm{cm}$.

    (ii)If the magnet is turned through 90° , the resultant field at the location of the null point will be.

    A. $2\sqrt{5} \times 10^{-4}\ \mathrm{T}$

    B. $4\sqrt{5} \times 10^{-4}\ \mathrm{T}$

    C. $3\sqrt{5} \times 10^{-4}\ \mathrm{T}$

    D. $8\sqrt{5} \times 10^{-4}\ \mathrm{T}$

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15. Assertion (A) : Magnetic moment of an atom is due to both, the orbital motion and spin motion of every electron.

    Reason (R) : A charged particle at rest produces a magnetic field.

    A. Both (A) and (R) are true, (R) is the correct explanation of (A)

    B. Both (A) and (R) are true, (R) is not the correct explanation of (A)

    C. (A) is true but (R) is false.

    D. (A) is false but (R) is true.

16. Assertion (A) : The poles of a magnet cannot be separated by breaking into two pieces.

    Reason (R) :The magnetic moment will be reduced to half when a magnet is broken into two equal pieces.

    A. Both (A) and (R) are true, (R) is the correct explanation of (A)

    B. Both (A) and (R) are true, (R) is not the correct explanation of (A)

    C. (A) is true but (R) is false.

    D. (A) is false but (R) is true.

17. Assertion (A) : When a magnet is placed in a non-uniform magnetic field , it experiences both translatory and rotatory motion.

    Reason (R) : The poles of the bar magnet experiences resultant force and torque.

    A. Both (A) and (R) are true, (R) is the correct explanation of (A)

    B. Both (A) and (R) are true, (R) is not the correct explanation of (A)

    C. (A) is true but (R) is false.

    D. (A) is false but (R) is true.

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18. A short bar magnet of moment $4\ \mathrm{Am}^2$ is placed in the magnetic meridian with its south-pole pointing geographic north. The distance between two null points is found to be $20\ \mathrm{cm}$.

(iii)If the same magnet is placed with its north pole pointing geographic north, then the distance between the null points $(\text{use } 4\sqrt{\frac{1}{3}} = 1.59)$.

A. $1.59\ \mathrm{m}$

B. $0.159\ \mathrm{m}$

C. $15.59\ \mathrm{m}$

D. $0.0159\ \mathrm{m}$

19. The poles of a horse-shoe magnet each of pole strength $2\ \mathrm{Am}$ are at $4\ \mathrm{cm}$ apart.

(i)The magnetic moment of the horse-shoe magnet is $(\text{in } \mathrm{Am}^2)$

A. 0.04

B. 0.06

C. 0.08

D. 0.02

20. The poles of a horse-shoe magnet each of pole strength $2\ \mathrm{Am}$ are at $4\ \mathrm{cm}$ apart.

(ii)The magnetic induction at the mid point between the poles is $(\text{in } \mathrm{T})$

A. 10^{-3}

B. 0.125×10^{-3}

C. 0.5×10^{-3}

D. 0.25×10^{-3}