doubtnut
India's Number 1 Education App

PHYSICS

BOOKS - NIKITA PHYSICS (HINGLISH)

MAGNETISM

Mcqs

1. Natural magnets were found near ancient city

A. Madurai

B. Magnesia

C. Madras

D. Newyark

Answer: B

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2. The property of attracting small pieces of iron is referred to as magnetism.The minerals existing this influence is called as

A. Magnesia

B. Artificial magnet

C. Natural magnets

D. All of these

Answer: C

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3. The electric intensity at any point due to point is given by,Intensity=electric force/charge.In analogy of this,What will be

magnetic induction at any point due to a magnetic charge?

A. F/m

B. F/M

C. m/F

D. M/F

Answer: A

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4. The elctric potential at any point due to a point charge is $v = \frac{1}{4\pi \in_0} \frac{q}{r}$.In analogy with this ,What will be magnetic potential at any point due to a magnetic charge?

A. $\frac{\mu_0}{4\pi} \frac{m^2}{r}$

B. $\frac{\mu_0}{4\pi} \frac{m}{r}$

C. $\frac{\mu_0}{4\pi} \frac{m}{r^2}$

D. $\frac{\mu_0}{4\pi} \frac{r^2}{m}$

Answer: B

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5. The electric intensity at any point due to point charge is $E = \frac{1}{4\pi \in_0} \times \frac{q}{r^2}$.In analogy with this,What will be magnetic iduction at a point due to a magnetic charge?

A. $\frac{\pi_0}{4\pi} \frac{m}{r^2}$

B. $\frac{\pi_0}{4\pi} \frac{m^2}{r^2}$

C. $\frac{\pi_0}{2\pi} \frac{m}{r^2}$

D. $\frac{\pi_0}{4\pi} \frac{r^2}{m}$

Answer: A

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6. The magnetic lines of force

A. Do not intersect

B. Intersects at infinity

C. Intersects within the magnet

D. Intersects at neutral point

Answer: A

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7. If a magnet is kept in air surrounded by an iron ring the lines of force from the magnet will be

A. Crowed in the air

B. Evenly distributed

C. Crowded in the ring

D. Unevenly distributed

Answer: C

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8. The lines of forces due to earth's horizontal component of magnetic field are

A. Parallel

B. Straight

C. elliptical

D. Both 'a' and 'b'

Answer: D

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9. A magnetic needle is kept in a non uniform magnetic field . It experiences

A. A force and torque

B. A torque but not a force

C. A force but not a torque

D. neither a torque nor a force

Answer: C

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10. The process of conversion of iron and its alloys into a magnet is

A. Magnetism

B. Magnetisation

C. Magnetic dipole

D. All of these

Answer: B

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11. The ends of the magnet at which magnetic properties of magnet are concentrated are

A. Poles

B. Pole strength

C. Axis

D. Equator

Answer: A

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12. Magnetic lines of induction in external space and inside the magnetic dipole respectively go from

A. S-pole to N-pole and N-pole to S-pole

B. N-pole to S-pole and S-pol to N-pole

C. S-pole to N-pole and S-pole to N-pole

D. N-pole to S-pole and N-pole to S-pole

Answer: B

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13. A magnetic dipole of moment M is placed in uniform magnetic field B so that angle betweem direction of M and B is θ,the torque acting on the magnetic dipole is

A. MB $\sin\theta$

B. MB$\tan\theta$

C. MB $\cos\theta$

D. MB

Answer: A

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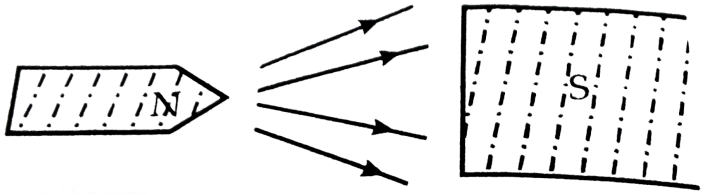
14. A magnetic field is produced by the two magnets as shown In the figure.The magnetic field is



A. uniform

B. Non uniform and N is a strong end

C. Non uniform ansd S is a strong end

D. Uniform and both N and S are equally strong.

Answer: B

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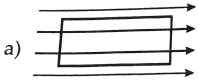
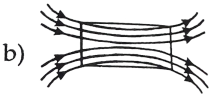
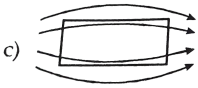
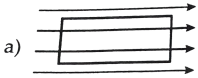
15. A uniform megnetic field, parallel to the plane of the paper exixted in space intially directed from left to right. When a bar of soft iron is placed in the field parallel to it, the lines of force passing through it will be represented by

A. 

B. 

C. 

D. 

Answer: B

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16. Magnetic moment of a bar magnet is equal to a moment of a couple which is required to keep it

A. Parallel to a uniform magnetic field of unit induction

B. Perpendicular to a uniform magnetic field of unit induction

C. Parallel to a uniform magnetic field of any induction

D. Perpendicular to a unifrom field of any induction

Answer: B

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17. A bar magnet produces a field which is similaar to a field produced by current flowing through

A. A circular coil

B. Straight conductor

C. A rectangular coil

D. A solenoid

Answer: D

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18. The magnet can be completely demagnetized by

A. Dropping it into ice cold water

B. A reverse field of appropriate strength

C. breaking the magnets into small pieces

D. Heating it slightly

Answer: B

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19. The systerm of two fictitious poles separated by certain distance is called as

A. Electric dipole

B. Magnetic dipole

C. Magnetic dipole moment

D. None of these

Answer: B

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20. The magnetic dipole moment of a bar magnet each of pole stregth m is given by

A. ml/4

B. m 2l

C. ml

D. ml/2

Answer: B

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21. If a circular coil area A,number of turns n carries a current I then it is equivalent to a magnetic dipole.The magnetic moment of a coil is,

A. 2nIA

B. nIA

C. nIA/2

D. n^2IA

Answer: B

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22. SI unit of magnetic pole strength is

A. Am^2

B. A^2m

C. Am

D. $A^{-1}m^{-1}$

Answer: C

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23. The S.I unit of magnetic dipole moment is

A. Am^2

B. A^2m

C. Am

D. $A^{-1}m^{-1}$

Answer: A

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24. The line joining the two poles of a magnet is called as

A. Magnetic equator

B. Magnetic induction

C. Magnetic potential

D. Magnetic axis

Answer: D

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25. The distance between two poles of magnets is called as

A. Magnetic axis

B. Magnetic length

C. Magnetic dipole

D. Magnetic dipole moment

Answer: B

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26. The perpendicular drawn to magnetic axis and passing through centre of magnetic dipole is called as

A. Magnetic length

B. Mafnetic equator

C. Magnetic dipole moment

D. None of these

Answer: B

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27. The ability of interaction of the either pole of the dipole is

A. Pole stregth

B. Magnetic moment

C. magnetic dipole

D. None of these

Answer: A

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28. The product of the magnitude of the pole stregth and the magnetic length is

A. Pole stregth

B. Magnetic moment

C. Magnetic dipole moment

D. None of these

Answer: B

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29. A device cosisting of two fictitious poles separated by a finite distance is

A. Bar magnet

B. magnetic dipole

C. both 'a' and 'b'

D. neither 'a' nor 'b'

Answer: C

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30. Magnetic dipole moment is a vector directed from

A. S pole to N pole

B. N pole to S pole

C. Perpendicular to dipole

D. None of these

Answer: A

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31. A magnet is cut into two pieces perpendicular to its legth,then each piece will be a magnet of

A. Same pole strength

B. Different pole strength

C. May increase or decrease inpole stregth

D. Can not be predicted

Answer: A

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32. When a magnet is cut into two pieces along its length,then each piece of magnet will have

A. Same pole strength

B. Reduced pole strength

C. Increased pole strength

D. Can not be predicted

Answer: B

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33. A short bar magnet has a magnetic moment of 10 Am^2.If its length is 10 cm,then the pole strength of the dipole is

A. 200 Am

B. 100 Am

C. 150 Am

D. 50 Am

Answer: B

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34. A bar magnet of magnetic moment M is cut into two parts of equal

length/breadths.The magnetic moment of each part will be

A. Zero

B. 0.5 M

C. M

D. 2M

Answer: B

35. Two identical thin bar magnets, each of length L and pole strength m are placed at right angles to each other, with the N pole of one touching the S-pole of the other. Find the magnetic moment of the system.

A. 0.5ml

B. m l

C. 2 ml

D. $\sqrt{2ml}$

Answer: D

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36. A large magnet is broken into two pieces,so that their length are in the ratio 2:1.The pole strength of the two piece will be in the ratio

A. $4:1$

B. $2:1$

C. $1:2$

D. $1:1$

Answer: D

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37. A thin rod of length L is magnetised and has magnetic moment M.The rod is then bent in a semicircular arc.The magnetic moment in the new shape is

A. $\frac{M}{L}$

B. $\frac{M}{\pi}$

C. $\frac{M}{2\pi}$

D. $\frac{2M}{\pi}$

Answer: D

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38. A steel wire of length l has a magnetic moment M. It is bent into a semicircular arc. What is the new magnetic moment?

A. $\frac{M}{2}$

B. $\frac{M}{\sqrt{2}}$

C. M

D. 2M

Answer: B

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39. A closlly wound coil of 1000 turns and cross sectional area $2 \times 10^{-4} m^2$ carries a current of 1.0 A.The magnetic moment of the coil is

A. $0.1Am^2$

B. $0.2AM^2$

C. $0.4Am^2$

D. $0.6Am^2$

Answer: B

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40. The magnetic induction at a point on axis of a short magnetic dipole is

A. $\frac{\pi_0}{4\pi}\frac{2M}{r^3}$

B. $\frac{\pi_0}{4\pi}\frac{3M}{r^3}1$

C. $\frac{\pi_0}{4\pi}\frac{M}{r^3}$

D. $\frac{\pi_0}{4\pi}\frac{2M^2}{r^3}$

Answer: A

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41. The magnetic induction at a point on equator of a short magnetic dipole is

A. $\frac{\pi_0}{4\pi}\frac{2M}{r^3}$

B. $\frac{\pi_0}{4\pi}\frac{M}{r^3}$

C. $\frac{\pi_0}{4\pi}\frac{2M}{r^2}$

D. $\frac{\pi_0}{4\pi}\frac{M}{r^2}$

Answer: B

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42. The magnetic induction at any point due to a short magnetic dipole is

A. $\frac{\pi_0}{4\pi}\frac{M}{r^3}\sqrt{3\cos^2\theta+1}$

B. $\frac{\pi_0}{4\pi}\frac{2M}{r^2}\sqrt{3\cos^2\theta+1}$

C. $\frac{\pi_0}{4\pi}\sqrt{3\cos^2\theta+1}$

D. $\frac{\pi_0}{4\pi}\frac{2M}{r^3\sqrt{3\cos^2\theta+1}}$

Answer: A

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43. The direction of resultant magnetic induction at any point due to a short

magnetic dipole is inclined to the axis dipole at an angle

A. $\tan^{-1}\left(\frac{1}{2}\tan\theta\right)$

B. $\frac{1}{2}\tan\theta$

C. $\tan^{-1}\left(\frac{\tan(\theta)}{2}\right)$

D. $\tan^{-1}(2\tan\theta)$

Answer: A

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44. The magnetic induction due to a bar magnet at an axial point is directed along the axis

A. From S pole to N pole

B. From N pole to S pole

C. Perpendicular to length of dipole

D. None of these

Answer: A

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45. The magnetic induction due to a bar magnet at an axial point is directed along the axis

A. From S pole N pole

B. From N pole to S pole

C. Perpendicular to length of dipole

D. None of these

Answer: B

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46. Magnetic induction at a point due to short magnetic dipole is B_1.The dipole is then cut into two equal parts.Magnetic induction at the same point due to either part is

A. $\frac{B_1}{4}$

B. $\frac{B_1}{2}$

C. B_1

D. $2B_1$

Answer: B

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47. If the angle 0 is varied,keeping r constant magnetic induction will

A. remain constant

B. increase from axis to equator

C. Decrease from axis to equator

D. None of these

Answer: C

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48. The magnetic induction at any point due to short magnetic dipole is inversely proportional to its

A. Distance

B. Square of distance

C. Cube of distance

D. None of these

Answer: C

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49. The magnetic field strength at a distance 2m from a magnetic pole is 2×10^{-7}T.The pole strength of pole is

A. 8AM

B. 4Am

C. 16Am

D. 80Am

Answer: A

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50. The ratio of magnitude of magnetic induction (B)at any point due to short magnetic dipole and the magnetic potential (V) at that point is given by

A. $\frac{B}{V} = \frac{\sqrt{3\cos^2\theta + 1}}{r\cos\theta}$

B. $\frac{B}{V} = \frac{r\cos\theta}{\sqrt{3\cos^2\theta + 1}}$

C. $\frac{B}{V} = \frac{\sqrt{2\cos^2\theta + 1}}{r\cos\theta}$

D. $\frac{B}{V} = \frac{\sqrt{\cos^2\theta + 1}}{r\cos\theta}$

Answer: A

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51. The direction of magnetic induction at a point on the axis of short magnetic dipole is

A. In the direction of magnetic moment

B. Opposite to direction of magnetic moment

C. Perpendicular to direction of magnetic moment

D. Can not be predicted

Answer: A

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52. The dirrection of magnetic induction at a point on equator of magnetic dipole is

A. In the direction of magnetic moment

B. opposite to direction of magnetic moment

C. Perpendicular to magnetic moment

D. Can not be predicated

Answer: B

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53. Two points A and B are situated perpendicular to the axis of 4 cm long bar magnet at a distance x and 3x from its centre

on opposite sides. The ratio of magnetic inductions at A and B will be equal to

A. $27:1$

B. $2:9$

C. $6:8$

D. $1:9$

Answer: A

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54. In a hydrogen atom the electrons revolves round the nucleus 6.8×10^{15} times per second in a n orbit of radius 0.53 Å.Determine its equivalent magnetic moment $\left(e = 16 \times 10^{-19} C\right)$

A. $9.1 \times 10^{-24} Am^2$

B. $9.3 \times 10^{-24} Am^2$

C. $9.0 \times 10^{-24} Am^2$

D. $9.6 \times 10^{-24} Am^2$

Answer: D

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55. Magnetic moment of a bar magnet is 2.4 Am^2A point is situated at 20 cn from its centre on a line making an angle of 30° with axis.The magnetic induction at that point is

A. $5.42 \times 10^{-5} Wb/m^2$

B. $5.14 \times 10^{-5} Wb/m^2$

C. $4.51 \times 10^{-5} Wb/m^2$

D. $4.15 \times 10^{-5} Wb/m^2$

Answer: A

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56. A point is situated at a certaim distance along a line making an angle of 30° with magnetic equator.The direction of magnetic induction at that point is

A. $40^\circ 54'$

B. $40^\circ 45'$

C. $40^\circ 32'$

D. $40^\circ 44'$

Answer: A

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57. The magnetic field at a distance d from a short bar magnet in longitudinal and transverse positions are in the ratio.

A. $1:1$

B. $1:2$

C. $2:1$

D. $3:1$

Answer: C

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58. The magnetic induction at a point P on the axis is equal to the magnetic induction at a point Q on the equator of a short magnetic dipole. What is the ratio of the distances of P and Q from the centre of the dipole?

A. $1.26:1$

B. $12.6:1$

C. $2:1$

D. $1.62:1$

Answer: A

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59. The magnetic induction due to short magnetic dipole of moment $0.1\ \mathrm{A\,m^2}$ at

equatorial point 1 cm away from centre of dipole is $\left(\mu_0 = 4\pi \times 10^{-7} Wb/Am\right)$

A. 0.1T

B. 0.01 T

C. 0.001T

D. 0.0001 T

Answer: B

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60. Magnetic induction at a point (r,30°)is B_1 and that at a point (r,60°) is B_2 due to a short magnetic dipole.The ratio $B_1:B_2$ is

A. $1:2$

B. $2:1$

C. $\sqrt{13/7}$

D. $\sqrt{7/13}$

Answer: c

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61. Magnetic induction at a point $(r, 0^\circ)$ due to a short magnetic dipole is B_1.The magnetic induction due to the same dipole at a point $(r, 60^\circ)$ isB_2.The ratio of $B_1 : B_2$ is

A. $1:1$

B. $\sqrt{7}:2$

C. $\sqrt{7}:4$

D. $4:\sqrt{7}$

Answer: D

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62. The amount of work done in carrying a unit N-pole from infinity to a point against the magnetic field is

A. Magnetic induction

B. Magnetic potential

C. Magnetic moment

D. Magnetic torque

Answer: B

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63. The magnetic potential at a point due to pole of strength m at a distance r is

A. $V = \frac{\mu_0}{4\pi}\frac{m}{r}$

B. $V = \frac{\mu_0}{\pi r}\frac{m}{r^2}$

C. $V = \frac{\mu_0}{4\pi}\frac{m}{r^3}$

D. $V = \frac{\mu_0}{4\pi}\frac{2m}{r}$

Answer: A

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64. The magnetic potential at any point due to short magnetic dipole is

A. $V = \frac{\mu_0}{4\pi}\frac{M}{r}$

B. $V = \frac{\mu_0}{4\pi}\frac{M}{r^2}$

C. $V = \pm\frac{\mu_0}{4\pi}\frac{M}{r^2}$

D. $V = 0$

Answer: CD

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65. The magnetic potential at any point to a short magnetic dipole is inversely proportional to

A. Distane

B. Square of distance

C. Cube of distance

D. None of these

Answer: B

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66. The magnetic potential at a point along the axis of a short magnetic dipole is

A. $V = \frac{\mu_0}{4\pi}\frac{M}{r^2}$

B. $V = -\frac{\mu_0}{4\pi}\frac{M}{r^2}$

C. $V = \pm\frac{\mu_0}{4\pi}\frac{M}{r^2}$

D. $V = 0$

Answer: CD

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67. The magnetic potential at any point on equator of a short magnetic dipole is

A. $V = \frac{\mu_0}{4\pi} \frac{M \cos\theta}{r^2}$

B. $V = \frac{\mu_0}{4\pi} \frac{M}{r^2}$

C. V=0

D. V=M

Answer: C

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68. A magnetic of magnetic moment 215 Am^2 placed on the magnetic meridian with its N-pole towards grographic north.The distance between the two neutral points is 12 cm.The horizontal component of earth's field at that place is

A. 0.1 T

B. 0.025 T

C. 1T

D. 25T

Answer: A

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69. The magnetic potential at a point on the line inclined at 30° with the axis of a short magnet is $1.5 \times 10^{-5} J/Am$If the magnetic moment is $1.732 Am^2$,What will be distance of point from centre of the magnet?

A. 10cm

B. 1 cm

C. 0.1 cm

D. 0.001cm

Answer: B

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70. Find the ratio of the magnetic potential due to the magnetic dipole at two equidisatant points.One of them along a line making an angle of 30° with the magnetic

dipole moment vector of 60° with the magnetic diopole vector.

A. $2:\sqrt{3}$

B. $\sqrt{3}:1$

C. $3:\sqrt{3}$

D. $1/\sqrt{3}:4$

Answer: B

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71. The pole strength of a bar magnet of magnetic moment $5Am^2$ and geometric length 6 cm is

A. $10AM$

B. 100 Am

C. 1000 Am

D. $1AM$

Answer: B

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72. The magnetic potential at a point 1m away from the centre of a short magnetic dipole of moment 50 Am^2 along a line inclined to the dipole axis at60° is

A. $2.5 \times 10^{-6} J/Am$

B. $5.2 \times 10^{-6} J/Am$

C. $2.5 \times 10^{-5} J/Am$

D. $6.2 \times 10^{-5} J/Am$

Answer: A

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73. The magnetic potential at a point at a distance r from its centre along its axis is V.The magnetic potential at a point at the distance 2 r will be

A. V

B. 2V

C. V/2

D. V/4

Answer: D

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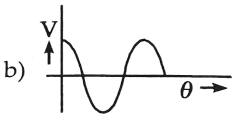
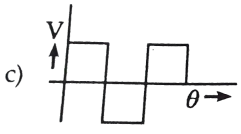
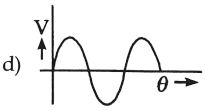
74. Keeping r constant a graph is plotted by varying both 0 and the potential V due to the magnetic dipole.Which is a correct graph in the figure given below?

A. 

B. 

C. 

D. 

Answer: B

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75. A straight wire carring current I is turned into a circular loop. If the magnitude of magnetic moment associated with it in M.K.S. unit is M, the length of wire will be

A. $\frac{4\pi}{M}$

B. $\frac{M\pi}{41}$

C. $\sqrt{\frac{4\pi M}{1}}$

D. $\sqrt{\frac{4\pi I}{M}}$

Answer: C

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76. A bar magnet of magnetic moment M is

bent in

shape with equal arm lengths.The new magnet

moment is

A. M

B. M/2

C. M/3

D. M

Answer: C

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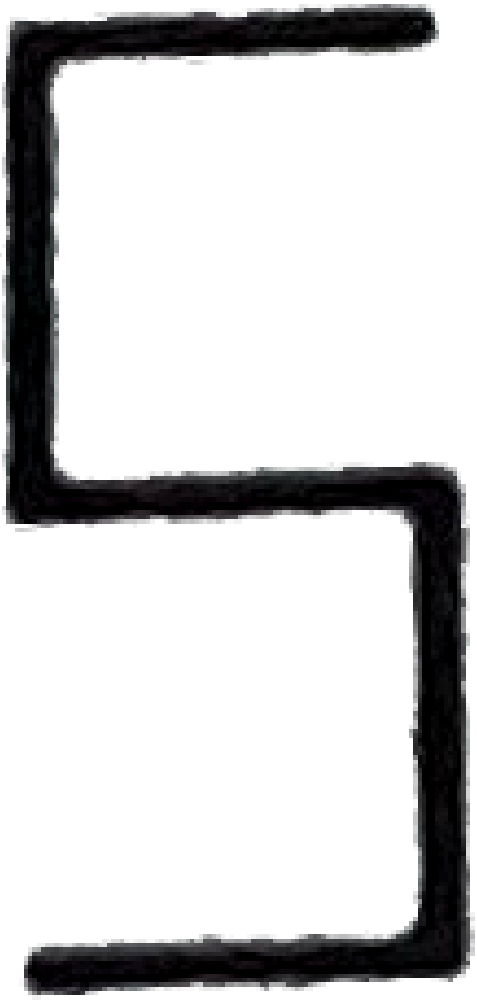
77. A magnetic wire magnetic moment M is bent into a shape



with all segments of equal length the new magnetic

moment is

A. $\frac{M}{5}$

B. $\sqrt{5M}$

C. $\frac{M}{\sqrt{5}}$

D. 5M

Answer: C

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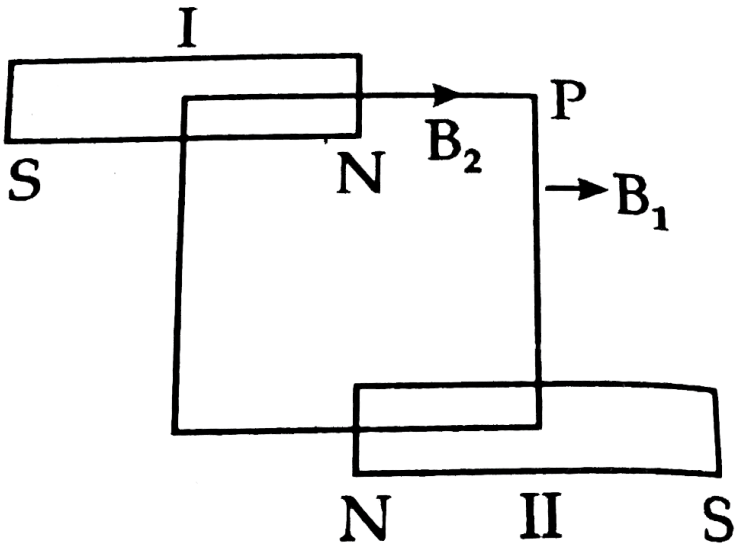
78. Two short bar moment each $200A - m^2$ are placed as shown in the figure at the corners of a square of side 10 cm.The magnetic induction at P is



A. $8 \times 10^{-2} T$

B. $6 \times 10^{2} T$

C. $2 \times 10^{-2} T$

D. $6 \times 10^{-1} T$

Answer: B

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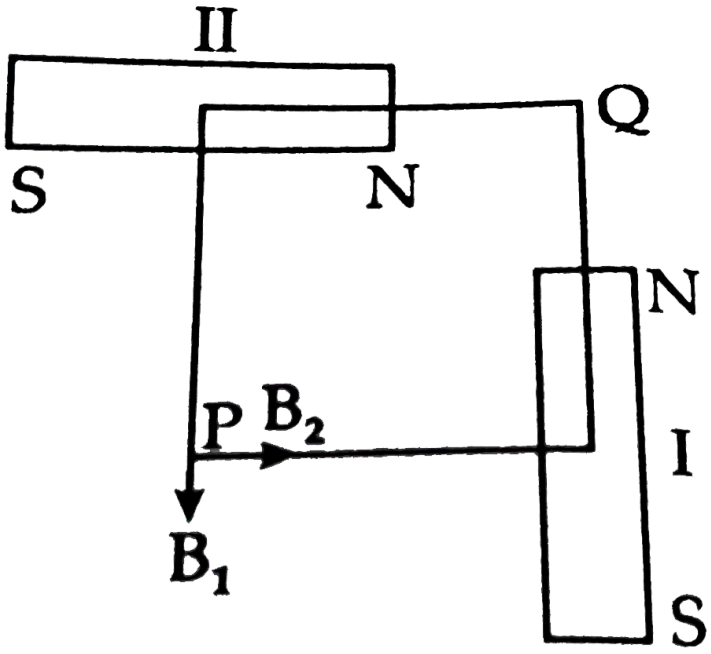
79. Two short bar magnets of moment each $100 A - m^2$ are placed as shown in figure at the corners of a square of side 10 cm.The

magnetic induction at P is



A. Zero

B. $2\sqrt{2} \times 10^{-2}T$

C. $\sqrt{2} \times 10^{-2}T$

D. $2 \times 10^{-2}T$

Answer: C

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80. A circular loop of radius $0.0157m$ carries a current of 2.0 amp. The magnetic field at the centre of the loop is

$(\mu_0 = 4\pi \times 10^{-7} \text{weber} / amp - m)$

A. $1.57 \times 10^{-5} weber / m^2$

B. $8.0 \times 10^{-5} weber / m^2$

C. $2.0 \times 10^{-5} weber / m^2$

D. $3.14 \times 10^{-5} weber / m^2$

Answer: B

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81. Current carrying circular loop acts as

A. Magnetic dipole

B. Magnetic flux

C. Magnetic field

D. Condenser

Answer: A

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82. The product of nuber of turns,area of coil and current is

A. Electric dipole

B. Magnetic dipole moment

C. Magnetic dipole

D. Magnetic potential

Answer: B

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83. Magnetism in substances is caused by

A. Orbital motion of electrons only

B. Spin motion of electrons only

C. Due to spin and orbital motion of electrons

D. Hidden magnets only

Answer: C

Watch Video Solution

84. The product of number of turns and current of loop is

A. Ampere turn

B. Flux density

C. Charge

D. None of these

Answer: A

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85. The product of ampere turn and area of coil is

A. Magnetic dipole moment

B. Torque

C. Magnetic potential

D. Magnetic induction

Answer: A

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86. In a hydrogen atom the electrons revolves round the nucleus 6.8×10^{15} times per second in a n orbit of radius 0.53 Å.Determine its equivalent magnetic moment $\left(e = 16 \times 10^{-19} C\right)$

A. $9.1 \times 10^{-24} Am^2$

B. $9.3 \times 10^{-24} Am^2$

C. $9.0 \times 10^{-24} Am^2$

D. $9.6 \times 10^{-24} Am^2$

Answer: D

Watch Video Solution

87. Magnetic moment of coil independent of

A. Area of coil

B. Number of turn

C. Stregth of magnetic field

D. Area of coil

Answer: C

Watch Video Solution

88. The electron in the hydrogen atom is moving with a speed at $2.3 \times 10^6 m/s$ in an orbit of radius 0.53 Å.The magnetic of the revolving electron is

A. $9.13 \times 10^{-24} Am^2$

B. $8.7 \times 10^{-24} Am^2$

C. $9.3 \times 10^{-24} Am^2$

D. $9.3 \times 10^{-24} Am^2$

Answer: D

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89. A closely wound solenoid of 1000 turns and area of cross-section $2 \times 10^{-4} m^2$ carries a current of 1A.It is placed in horizontal axis at 30° with the diretion of uniform magnetic

field of 0.16 T.Magnetic moment of solenoid and torque experienced by the solenoid due to the field are

A. $0.1Am^2$,0.016 Nm

B. $0.2Am^2$,0.026 Nm

C. $0.2Am^2$,0.016Nm

D. $0.4Am^2$,0.116Nm

Answer: C

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90. A circular coil of 300 turns and diameter $14cm$ carries a current of $15A$. What is the magnitude of magnetic moment linked with the loop?

A. 29.27 Am^2

B. 89.27 Am^2

C. 49.27 Am^2

D. 69.27 Am^2

Answer: D

Watch Video Solution

91. In a hydrogen atom,an electron revolves with a frequency of 6.8×10^9MHz in an orbit of diameter 1.06 Å.The equivalent magnetic moment is

A. $9.5 \times 10^{-22} Am^2$

B. $7.5 \times 10^{-10 Am^2}$

C. $4.5 \times 10^{-24} Am^2$

D. $9.5 \times 10^{-24} Am^2$

Answer: D

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92. A circular coil of radius 4 cm having 20 turns carries a current of 3A.It is a magnetic field of intensity 0.5 Wb/m^2.The magnetic dipole moment of the coil is

A. $0.3Am^2$

B. $1.3Am^2$

C. $0.15Am^2$

D. $0.6Am^2$

Answer: A

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93. A current of 2 ampere is passed in a coil of radius 0.5 m and number of turns 20.The magnetic moment of the coil is

A. $0.314Am^2$

B. $0.14A - m^2$

C. $314A - m^2$

D. $31.4A - m^2$

Answer: D

Watch Video Solution

94. The areas of cross-section of three magnets of same length are A,2AA and 6A respectively The ratio of their magnetic moments will be

A. $6:2:1$

B. $1:2:6$

C. $1:4:36$

D. $36:4:1$

Answer: B

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95. Maghnetic dipole moment of revolving electron is

A. $\frac{evr}{2}$

B. $ef\pi r^2$

C. both 'a' and 'b'

D. neither 'a' not 'b'

Answer: C

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96. The ratio of magnetic dipole moment to angular momentum of electron is

A. Turns ratio

B. Ampere's ratio

C. Gyromagnetic ratio

D. Poissons ratio

Answer: C

Watch Video Solution

97. The gyromagnetic ratio of electron is

A. $8.8 \times 10^{10} C / kg$

B. $4.8 \times 10^{10} C / Kg$

C. $6.8 \times 10^{10} C / kg$

D. $5.8 \times 10^{10} C / Kg$

Answer: A

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98. Magnetic dipole moment of revolving electron is

A. $\frac{eL}{2m}$

B. $\frac{e}{2m}$

C. $\frac{e}{2ML}$

D. $\frac{e}{mL}$

Answer: A

Watch Video Solution

99. An electron in an atom revolves the nucleus in an orbit of radius 0.53 Å equivalent magnetic moment,if the frequency of revolution of electron is 6.8×10^9 MHz is

A. $9.603 \times 10^{-24} Am^2$

B. $6.603 \times 10^{-24} Am^2$

C. $3.603 \times 10^{-24} Am^2$

D. $2.603 \times 10^{-24} Am^2$

Answer: A

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100. An electron in an atom revolves around the nucleus in an orbit of radius $0 \cdot 5Å$. Calculate the equivalent magnetic moment if the frequency of revolution of electron is $10^{10} MHz$

A. $1.257 \times 10^{-23} Am^2$

B. $2.357 \times 10^{-23} Am^2$

C. $1.157 \times 10^{-23} Am^2$

D. $5.25 \times 10^{-23} Am^2$

Answer: A

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101. The ratio of magnetisation I to the magnetic field intensity H is

A. Susceptibility

B. Permeability

C. Permittivity

D. All of those

Answer: A

Watch Video Solution

102. The magnetic dipole moment per unit volume of the substance is knwn as

A. Magnetic induction

B. Magnetic flux density

C. Intensity of magnetisation

D. Magnetic permeability

Answer: C

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103. The ratio of magnetic induction (B)to the strength of magnetising field is called

A. Magnetic permeability

B. Magnetic subsceptibility

C. Intensity of magnetisation

D. Magnetic flux density

Answer: A

Watch Video Solution

104. The ratio of the intensity of the magnetisation to the strength of magnetising field is called

A. Magnetic flux density

B. Magnetic subsceptibility

C. Magnetic permeability

D. None of these

Answer: B

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105. The relation between magnetic induction(B),magnetising field (H)And the magnetisation (I) is

A. $B = \mu_0(H + 1)$

B. B=(H+1)

C. $B = \mu_0(H - 1)$

D. $B = \mu_0 l(H = 1)$

Answer: A

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106. For a paramagnetic material,the dependence of the magnetic susceptibility x on the absolute temprature T is given by

A. $x00T$

B. $x = cons\tan t\sqrt{T}$

C. $x\infty\frac{1}{T}$

D. x=costant

Answer: C

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107. If M is magnetic moment developed in the material having volume V,then intensity of magnetisation is given by expession.

A. MV

B. M/V

C. $M\sqrt{V}$

D. $\frac{M}{\sqrt{V}}$

Answer: B

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108. The ratio subceptibility of a paramagnetic substance is 3×10^{-4},It is placed in a

magnetising field of 4×10^4amp/m.The intensity of magnetisation will be

A. $3 \times 10^8 \frac{A}{m}$

B. $12 \times 10^8 \frac{A}{m}$

C. 12 A/m

D. 24 A/m

Answer: C

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109. A rod ferromagnetic with dimensions $10 \times 0.5 \times 0.2$cm is placed in a magnetic field of strength 0.5×10^4 amp/m as a result of which a magnetic moment of 4 amp-m^2 is produced in the rod.The value of magnetic induction will be

A. 0.54 tesla

B. 6.28 tesla

C. 0.358 tesla

D. 2.519 tesla

Answer: B

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110. An iron rod of length 20 cm and diameter 1 cm is placed inside a solenoid on which the number of turns is 600.The relative permeability of the rod is 1000.If a current of 0.5 A ios placed in the solenoid,then magnetisation of the rod will be

A. $2.997 \times 10^2 \frac{A}{m}$

B. $2.9979 \times 10^3 \frac{A}{m}$

C. $2.997 \times 10^4 \frac{A}{m}$

D. $2.997 \times 10^5 \frac{A}{m}$

Answer: B

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111. The space inside a toroid is filled with tungsten whose susceptibility is 6.8×10^{-5}. The percentage increase in the magnetic field will be

A. 2.8×10^{-3}

B. 6.8×10^{-3}

C. 4.8×10^{-3}

D. 5.8×10^{-3}

Answer: D

Watch Video Solution

112. The magnetization of a bar magnet of length 5 cm,cross-sectional area $2cm^2$ and magnetic moment 1 Am^2 is

A. $1 \times 10^5 \frac{A}{m}$

B. $2 \times 10^5 \frac{A}{m}$

C. $3 \times 10^5 \frac{A}{m}$

D. $4 \times 10^5 \frac{A}{m}$

Answer: A

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113. The percentage increase in magnetic field B when the space within a current carrying

toroid is filled with aluminum $(\chi = 2.1 \times 10^{-5})$ is

A. 5×10^{-3}

B. 2.1×10^{-3}

C. 3.1×10^{-3}

D. 2.1×10^{-5}

Answer: A

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114. A bar magnet made of steel has a magnetic moment of $2.5Am^2$ and mass of $6.6 \times 10^{-5}kg$. If the density of steel is $7.9 \times 10^3 kgm^{-3}$, find the intensity of magnetization of the magnet.

A. $1.0 \times 10^6 Am$

B. $4.0 \times 10^6 Am$

C. $3.0 \times 10^6 Am$

D. $8.0 \times 10^6 Am$

Answer: B

Watch Video Solution

115. A bar magnet made of steel has a magnetic moment of $2.5Am^2$ and mass of $6.6 \times 10^{-5}kg$. If the density of steel is $7.9 \times 10^3 kgm^{-3}$, find the intensity of magnetization of the magnet.

A. $1.0 \times 10^6 Am$

B. $4.0 \times 10^6 Am$

C. $4.0 \times 10^6 Am$

D. $3.0 \times 10^6 Am$

Answer: C

Watch Video Solution

116. The susceptibility of annealed iron at saturation is 5500. Find the permeability of annealed iron at saturation.

A. 1.9×10^{-3}

B. 6.9×10^{-3}

C. 3.9×10^{-3}

D. 7.9×10^{-3}

Answer: B

Watch Video Solution

117. The susceptibility of magnesium at $300K$ is 1.2×10^{-5}. At what temperature will the susceptibility increase to 1.8×10^{-5}?

A. 100K

B. 400K

C. 300K

D. 200K

Answer: D

Watch Video Solution

118. The magnetic field B and the magnetic intensity H in a material are found to be $1.6T$ and $1000Am^{-1}$ respectively. Calculate

the relative permeability μ, and the susceptibility χ of the material.

A. $1273, 1272$

B. $2.3 \times 10^3, 310^2$

C. $1.3 \times 10^3, 5 \times 10^2$

D. $4.3 \times 10^3, 3 \times 10^2$

Answer: A

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119. A magnetic field strength $(H) 3 \times 10^3 Am^{-1}$ produces a magnetic field of induction (B) of $12\pi T$ in an iron rod. Find the relative permeability of iron ?

A. 10^5

B. 10^4

C. 10^3

D. 10^2

Answer: B

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120. If relative permeability of iron is 2000,its absolute permeability is SI unit is

A. $8\pi \times 10^{-4}$

B. $8\pi \times 10^{-3}$

C. $800/\pi$

D. $\left(5 \times 10^{9}\right)/\pi$

Answer: A

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121. A bar magnet of magnetic moment $10Am^2$ has a cross sectional area of $2.5 \times 10^{-4}m^2$. If the intensity of magnetisation of the magnet is $10^6 A/m$, then the length of magnet is

A. 0.4 m

B. 0.04 cm

C. 0.04m

D. 50cm

Answer: C

Watch Video Solution

122. The magnetic moment of a magnet $(15cm \times 2cm \times 1cm) is 1.2A - m^2$. Calculate its intensity of magnetisation

A. $3 \times 10^4 A/m$

B. $4 \times 10^4 A/m$

C. $3 \times 10^{-4} A/m$

D. $4 \times 10^{-4} A/m$

Answer: B

Watch Video Solution

123. The relation connecting magnetic susceptibility χ_m and relative permeability μ_p, is

A. $x_m = \mu_r$

B. $x_m - 1 = \mu_r$

C. $\mu_r = 1 + x_m$

D. $\mu_r = 1 - x_m$

Answer: C

Watch Video Solution

124. A magnetising field of $2 \times 10^3 Am^{-1}$ produces a magnetic flux density of $8\pi T$ in an iron rod. The relative permeability of the rod will be

A. 10^2

B. 10^0

C. 10^3

D. 10^4

Answer: D

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125. An example of diamagnetic substance is

A. Mercury

B. Nickel

C. Aluminium

D. Oxygen

Answer: A

 Watch Video Solution

126. The range of magnetic susceptibility and relative magnetic permeability for diamagnetic subtance are

A. Zero

B. Equal to unity

C. less than unity

D. Greater than unity

Answer: C

Watch Video Solution

127. A small piece of unmagnetised substance gets repelled, when it is brougth near a powerful magnet. The substance can be _____.

A. Diamagnetic

B. Nonmagnetic

C. Ferromagnetic

D. Paramagnetic

Answer: A

Watch Video Solution

128. The universal proporty among all substance is

A. Magnetism

B. Diamagnetism

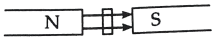
C. Paramagnetism

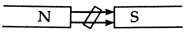
D. Ferromagnetism

Answer: B

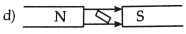
Watch Video Solution

129. If a rod of diamagneitc substance is freely suspended in a uniform magnetic field then it will set itself with its length

A. a) 

B. b) 

C. 

D. 

Answer: A

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130. At Curie point, a ferromagnetic material transforms into:

A. Diamagnetic

B. Nonmagnetic

C. Paramagnetic

D. Antimagnetic

Answer: C

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131. Which of the following is paramagnetic?

A. Gold

B. Water

C. Nickel

D. Aluminium

Answer: D

Watch Video Solution

132. The relative permeability is represented by μ_r and the susceptibility is denoted by χ for a magnetic substace. Then for for a paramagnetic subatance

A. Zero

B. Equal to unity

C. Less than unity

D. Greater than unity

Answer: D

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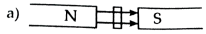
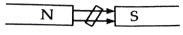
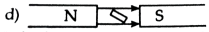
133. A rod of a paramagnetic material such as aluminium is suspended in a uniform storng magnetic field.How will it align it self in the field?

A. 

B. 

C. 

D. 

Answer: C

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134. Which of the following is ferromagnetic

A. Quartz

B. Nickel

C. Bismuth

D. Aluminium

Answer: B

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135. Iron shows its ferromagnetic property at

A. Below 770° C

B. Above 770° C

C. All temperatures

D. Normal tempratures

Answer: A

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136. Magnetic lines of force prefer to pass through ferromagnetic substances than air,because permeability for ferromagnetic substances is

A. Less than 1

B. equal to zero

C. Equal to 1

D. Greater than 1

Answer: D

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137. Which of the following is a paramagnetic substance?

A. Air

B. Water

C. Oxygen

D. Copper

Answer: C

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138. A material produces a magnetic field which oppose the applied magnetic field, then it is

A. Diamagnetic

B. Paramagnetic

C. Electromagnetic

D. Ferromagnetic

Answer: A

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139. The substances,Which are repelled by a magnet,are termed as

A. Diamagnetic

B. Paramagnetic

C. Ferromagnetic

D. Electromagnetic

Answer: A

Watch Video Solution

140. Which of the following substance is independent of temrature?

A. Diamagnetic

B. Paramagnetic

C. Ferromagnetic

D. None of these

Answer: A

Watch Video Solution

141. The magnetic moment of a diamagnetic substance is

A. Equal to zero

B. Less than zero

C. Greater than 1

D. None of these

Answer: A

 Watch Video Solution

142. If a rod of diamagneitc substance is freely suspended in a uniform magnetic field then it will set itself with its length

A. Perpendicular to the magnetic field

B. Parallel to the magnetic field

C. Inclined at an angle to the magnetic field

D. None of these

Answer: A

Watch Video Solution

143. If the magnetic lines of induction will move away from the substance,then the substance is

A. Ferromagnetic

B. Electromagnetic

C. Paramagnetic

D. Diamagnetic

Answer: D

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144. If a substance moves from stronger part to weaker part of the non uniform magnetic field than the substance is

A. Electromagnetic

B. Diamagnetic

C. Paramagnetic

D. Ferromagnetic

Answer: B

Watch Video Solution

145. If a diamagnetic liquid is placed in a watch glass on the pole pieces of a magnet, then the liquid will accumulate at

A. Centre

B. Ends

C. At some place

D. None of these

Answer: B

Watch Video Solution

146. In a non uniform field,the specimen of the paramagnetic substance rotates until its longest axis is

A. Vertical

B. Horizontal

C. Parallel to field

D. Perpendicular to field

Answer: C

Watch Video Solution

147. If a paramagnetic liquid is placed in a watch glass,resting on the pieces,the liquid accumulates where the field is

A. Zero

B. Weak

C. Strong

D. None of these

Answer: C

 Watch Video Solution

148. A material produces a magnetic field which oppose the applied magnetic field, then it is

A. Diamagnetic

B. Paramagnetic

C. Electromagnetic

D. None of these

Answer: B

Watch Video Solution

149. Which of the following phenomena depends on temprature?

A. Diamagnetism

B. Paramagnetism

C. Ferromagnetism

D. Borth 'B' and 'c'

Answer: D

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150. The substances which are strongly attracted by the magnet are

A. Diamagntic

B. Paramagnetic

C. Ferromagnetic

D. Electromagnetic

Answer: C

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151. The magnetic moment of the atoms of the paramagnetic substances is greater than

A. Zero

B. One

C. Two

D. Three

Answer: A

 Watch Video Solution

152. If a paramagnetic substance is placed in a non uniform magnetic field then it will move from

A. Weak field to strong

B. Strong to weak field

C. Remains stble

D. None of these

Answer: A

Watch Video Solution

153. If a paramagnetic substance is placed in a magnetic firld then magnetic lines of force will

A. Pass through it

B. Move away from it

C. Will accumulate through it

D. None of these

Answer: C

Watch Video Solution

154. The substances which are slightly attracted by the magnet are

A. Diamagnetic

B. PAramagnetic

C. Ferromagnetic

D. Electomagnetic

Answer: B

Watch Video Solution

155. The permanent magnet is made fron which one of the following substances?

A. Soft iron

B. Diamagnetic

C. PAramagnetic

D. Ferromagnetic

Answer: D

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156. At curie temprature,the ferromagnetic meterial

A. Loses its ferromagnetism

B. Develops reverse polarity

C. Has maximum subsceptibility

D. Has susceptibility equal to zero

Answer: A

Watch Video Solution

157. Ferromagnetic msterials owe their properties to

A. vecant inner shells

B. Filled inner subshells

C. Partially vecant inner shells

D. Partially filled inner subshells

Answer: D

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158. Domain formation is the necessary feature of

A. Non magnetics

B. Diamagnetics

C. Paramagnetics

D. Ferromagnetics

Answer: D

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159. The group of the atomic magnets formed due to interaction are called as

A. Domains

B. Resistances

C. Inductances

D. None of these

Answer: A

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160. When a material is used in a magnetic field B,a magnetic moment proportional to B

but opposite in direction is induced.The metal is

A. Diamagnetic

B. Paramagnetic

C. Ferromagnetic

D. Antimagnetic

Answer: A

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161. Subceptibility is positive and small for a

A. Paramagnetic substance

B. Ferromagnetic substance

C. Non magnetic substance

D. Diamagnetic substance

Answer: A

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162. Magnetic susceptibility for a paramagnetic and diamagnetic materials is respectively,

A. Small and negative

B. Small and positive

C. Large and positive

D. Large and negative

Answer: A

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163. A ferromagnetic substance like iron does not attract or repel other iron piece in absence of external field.This is because

A. There are no domains

B. There are domains and there magnetic moments are all perpendicular to the line joining the other piece

C. There are domains and there magnetic moments are randomly oriented

D. The magnetic moments of the two pieces cancel each other

Answer: C

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164. A short bar magnet is placed horizontally in N-S direction,with its north pole pointing to the north of earth.In this case,the neutral point is obtained

A. $B_{eq} = B_H$

B. $B_{eq} = B_{\text{axis}}$

C. $B_{eq} = B_V$

D. $B_{eq} = 2B_H$

Answer: A

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165. A short bar magnet is placed horizontally in N-S direction,with its N-pole pointing to

south of earth.In this case,the null point on its axis is obtained if

A. $B_{eq} = B_H$

B. $B_{\text{axis}} = B_H$

C. $B_{eq} = 2B_H$

D. $B_{a\xi s} = 2B_H$

Answer: B

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166. When the N-pole of a bar magnet points towards the south and S-pole towards the north, the null points are at the

A. Magnetic axis

B. Magnetic equator

C. N and S poles

D. Perpendicular divider of magnetic axis

Answer: A

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167. When the N-pole of a bar magnet points towards the south and S-pole towards the north, the null points are at the

A. Magnetic axis

B. Magnetic equator

C. N and S poles

D. Perpendicular divider of magnetic axis

Answer: B

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168. A magnet of megnetic moment 10 Am^2 has magnetic length 5 cm.The strength of magnet is

A. 100 Am

B. 200 Am

C. 300 Am

D. 400 Am

Answer: B

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169. A bar magnet has grometrical legth 4.8 cm.The magnetic moment of bar,of pole stregth 20 Am is

A. $0.8Am^2$

B. $0.6Am^2$

C. $0.4Am^2$

D. $1.0Am^2$

Answer: A

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170. The magnetic charges-2 Am and +2 Am are separated by a distance of 15 cm.The magnetic moment is

A. $0.25Am^2$

B. $1.0Am^2$

C. $0.5Am^2$

D. $0.3Am^2$

Answer: D

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171. The pole stregth potential at a point due to a short magnetic dipole of moment 5 Am^2 at a distance of 2m from its centre on a line making an angle of30° with it is

A. 40AM

B. 50 Am

C. 60 Am

D. 70 Am

Answer: B

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172. The magnetic potential at a point due to a short magnetic dipole of moment 5 Am^2 at a distance of 2 m from its centre and on a line making an angle of 30° with its equator is

A. 6.25×10^{-8}

B. $3.5 \times 10^{-7} J/Am$

C. $2.5 \times 10^{7} J/Am$

D. $3.5 \times 10^{7} J/Am$

Answer: A

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173. The magnetic potential at a point at a distance of 10 cm from mid point of magnetic dipole on a line making an angle of 60° with axis is $1.5 \times 10^{-7} Wb/m$.The magnetic moment of the dipole is

A. $0.01 Am^2$

B. $0.02 Am^2$

C. $0.03Am^2$

D. $0.04Am^2$

Answer: C

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174. The magnet potential at a point on the line inclined at 60° with the axis of short magnet is $1.5 \times 10^{-5} J/Am$.If the magnetic moment of magnet is $3Am^2$,then the distance

of the point from the centre of the dipole will bw

A. 0.1m

B. 0.1 cm

C. 0.01 m

D. 0.5 m

Answer: A

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175. The difference in potential of two points lying on the axis a distance of 50 cm and 100 cm respectivelym from its centre is

A. $9 \times 10^{7} J / Am$

B. $8 \times 10^{-7} J / Am$

C. $9 \times 10^{-7} J / Am$

D. $8 \times 10^{7} J / Am$

Answer: C

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176. The magnetic dipole moment of a short magnetic dipole which produces magnetic potential of $4 \times 10^{-4} Wb/m$ at axial point 2cm away from its centre is

A. $1.0 Am^2$

B. $1.4 Am^2$

C. $1.2 Am^2$

D. $1.6 Am^2$

Answer: D

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177. Magnetic potential and magnitude of magnetic induction due to short magnetic dipole of moment $2Am^2$ axial point at a distance of 20 cm from its centre are

A. $5 \times 10^{-6} J/Am, 5 \times 10^{-5} T$

B. $5 \times 10^{6} J/Am, 5 \times 10^{5} T$

C. $5 \times 10^{6} J/Am, 5 \times 10^{5} T$

D. $5 \times 10^{-6} J/Am, 5 \times 10^{-5} T$

Answer: A

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178. A point P is situated at a distance of 20cm from the centre of bar magnet of magnetic moment $8Am^2$ on line which makes an angle of 45° with its axis.The magnetic induction is

A. $1.0 \times 10^{-4}T, 16^\circ$

B. $1.5 \times 10^{-4}T, 26^\circ$

C. $1.5 \times 10^{4}T, 30^\circ$

D. $2.5 \times 10^{-4} T, 46^{\circ}$

Answer: B

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179. Magnetic induction due to short magnetic dipole of magnetic moment 4 Am^2 at a point 50 cm from centre of dipole on a line inclined at 30° with its axis.The magnetic induction is

A. $4.2 \times 10^{-6} T, 41^{\circ}$

B. $2.2 \times 10^{-6} T, 41^{\circ}$

C. $4.2 \times 10^{6} T, 21^{\circ}$

D. $2.2 \times 10^{-6} T, 31^{\circ}$

Answer: A

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180. The magnitude of magnetic induction due to a short magnetic dipole of moment $4 \times 10^{-3} Am^{2}$ at a diostance of 50 cm from its centre on axis is

A. $4.4 \times 10^{-9} T$

B. $6.4 \times 10^{-9} T$

C. $3.4 \times 10^{-9} T$

D. $2.4 \times 10^{-9} T$

Answer: B

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181. Point P lies on the axis of a short magnetic dipole at a distance of 0.4 m from centre,point Q lies at a distance of 0.25 m from centre of

the magnet and on the line inclined at 30° with the axis of the magnet.The ration of magnetic potentials at P and Q is

A. 1.45

B. 0.5

C. 2.45

D. 0.45

Answer: D

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182. The ratio of the magnetic ppotentials due to a magnetic dipole at two equidistant points,one of them along a line making an angle of 30° and the other along a line making an angle of 70° with the magnetic dipole moment vector is

A. 3.5

B. 1.5

C. 2.5

D. 4.5

Answer: C

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183. Magnetic p[otential at a point of 0.5 m from the centre of short dipole and on a line inclined at30° with equator is$2 \times 10^{-5} J/Am$ .The magnitude of magnetic induction at that point is nearly

A. $1 \times 10^{-4} T$

B. $2 \times 10^{-4} T$

C. $1 \times 10^4 T$

D. $2 \times 10^4 T$

Answer: A

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184. The potential at a point at a distance of 25 cm from the centre of a magnetic dipole on a line inclined at angle at 60° with its dipole moment vector is greater than the potential at a point on the same line at a distance of 50

cm from the centre,by $3 \times 10^{-7} J / Am$. The magnetic moment of the magnet is

A. $0.1 Am^2$

B. $2.5 Am^2$

C. $1.5 Am^2$

D. $0.5 Am^2$

Answer: D

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185. A short bar magnet is placed horizontally along the magnetic N-S direction with its axis along the magnetic E-W direction.The resultant horizontal magnetic induction on its equator at a distance of 20 cm from centre is $\left(B_H = 4 \times 10^{-5} T\right)$

A. $4.5 Am^2$

B. $5.4 Am^2$

C. $5.0 Am^2$

D. $4.0 Am^2$

Answer: B

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186. A short bar magnet of magnetic moment $3.2Am^2$is placed on a horizontal table with its axis along the magnetic E-W direction.The resultant horizontal magnetic induction on its equator at a distance of 20 cm from its centre is $\left(B_H = 4 \times 10^{-5}T\right)$

A. $5.6 \times 10^{-5}T$

B. $6.5 \times 10^{-5} T$

C. $5.6 \times 10^{5} T$

D. $6.5 \times 10^{5} T$

Answer: A

Watch Video Solution

187. A magnet vibrates in amagnetic field of strength $10^{-4}\pi^{2} T$. If the moment of magnet is $0.1 Am^{2}$ and its moment of inertia is

$10^{-5} Kgm^2$ then the period of oscillation will be

A. 0.5

B. 2 s

C. 0.3185 s

D. 3.14 s

Answer: B

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188. The magnetic induction and magnetic potential due to a magnetic dipole of moment $15Am^2$ at a distance of 1m from its centre along a line making an angle of60° with its axis are

A. $19.8 \times 10^{-7}T, 7.5 \times 10^{-7}J/Am$

B. $8.19 \times 10^{-7}T, 7.5 \times 10^{-7}J/Am$

C. $19.8 \times 10^{-7}T, 5.7 \times 10^{-7}J/Am$

D. $8.19 \times 10^{-7}T, 5.7 \times 10^{-7}J/Am$

Answer: A

Watch Video Solution

189. The pole strength of each pole of a short bar magnet having magnetic length 2 cm and the magnetic field produced by this magnet at a point 20 cm from the centre of the magnet on the line making an angle of 60° with the axis is $3.75 \times 10^{-5} Wb/m^2$,is

A. 213.4 Am

B. 103.4 Am

C. 111.4 Am

D. 113.4Am

Answer: D

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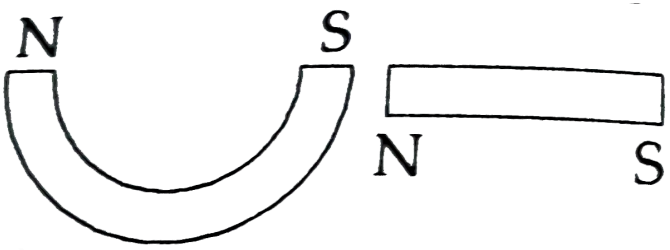
190. A bar magnet of moment M is cut into two identical pieces the length.One piece is bent in the form of a semi circle.The two pieces are arranged as shown.The resulting

moment is



A. $M\left(\frac{1}{2}+\pi\right)$

B. $\frac{M}{(2+\pi)}$

C. $M\left(\frac{\pi+2}{2\pi}\right)$

D. $M\left(2\frac{\pi}{\pi+2}\right)$

Answer: C

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191. A "bar" magnet of moment M is cut into two identical pieces along the length. One piece is bent in the form of a semi circle. If two pieces are perpendicular to each other, then resultant magnetic moment is

A. $(M/\pi)^2 + (M/2)^2$

B. $\sqrt{(m/\pi)^2 + (M/2)^2}$

C. $\sqrt{(m/\pi)^2 - (M/2)^2}$

D. Zero

Answer: B

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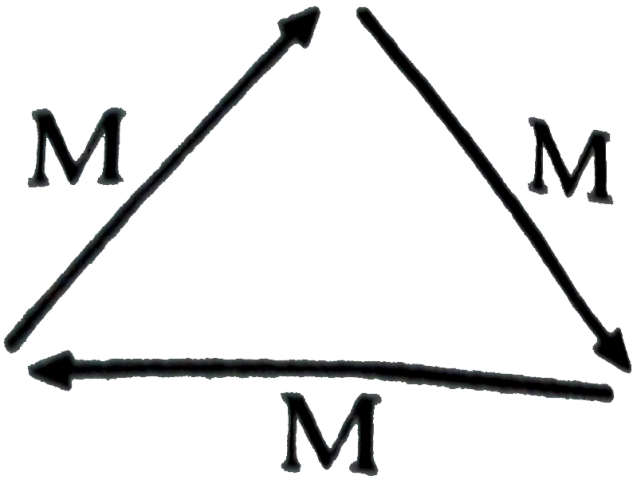
192. The resultant magnetic moment for the following arrangement is



A. 0

B. 2M

C. 3M

D. M

Answer: A

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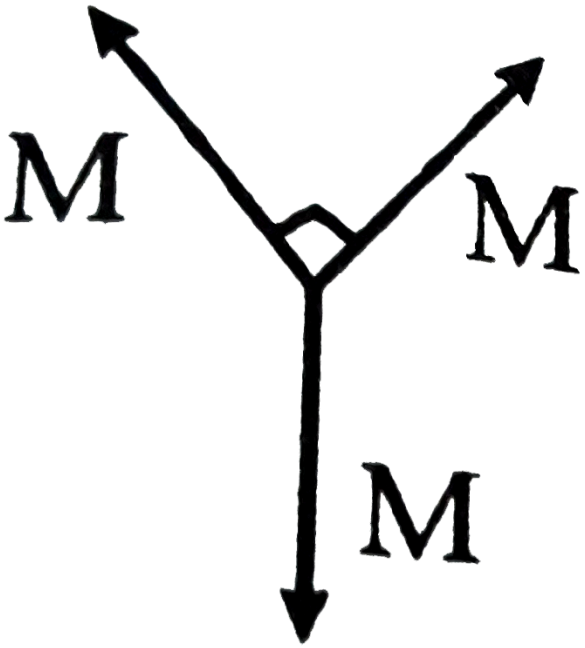
193. The resultant magnetic moment for the following arrangement is



A. $\sqrt{2}M$

B. $\left(\sqrt{2}+1\right)+M$

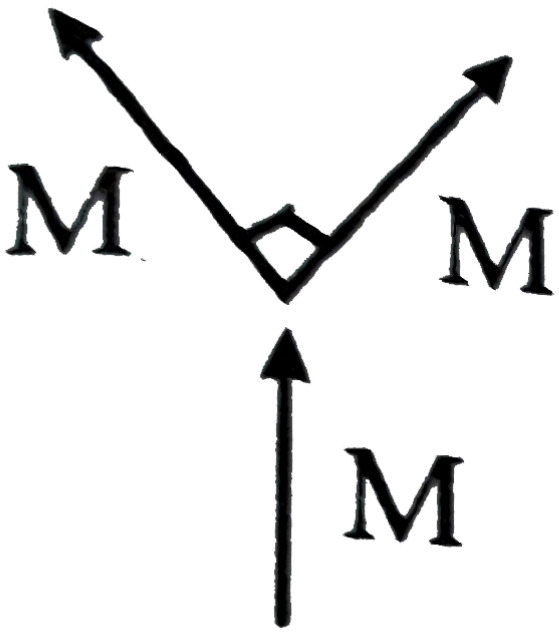
C. $\left(\sqrt{2}-1\right)M$

D. M

Answer: C

Watch Video Solution

194. The resulting magnetic moment for the following arrangement is



A. $\left(\sqrt{2}+1\right)M$

B. $\left(\sqrt{2-1}\right)M$

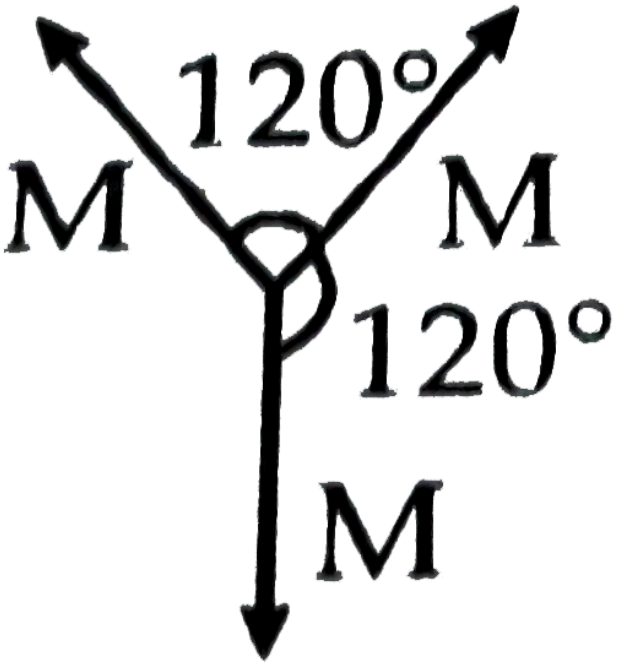
C. $\sqrt{2}M$

D. M

Answer: A

Watch Video Solution

195. The resultant magnetic moment for the following arrangement is



A. M

B. 2M

C. 3M

D. 0

Answer: D

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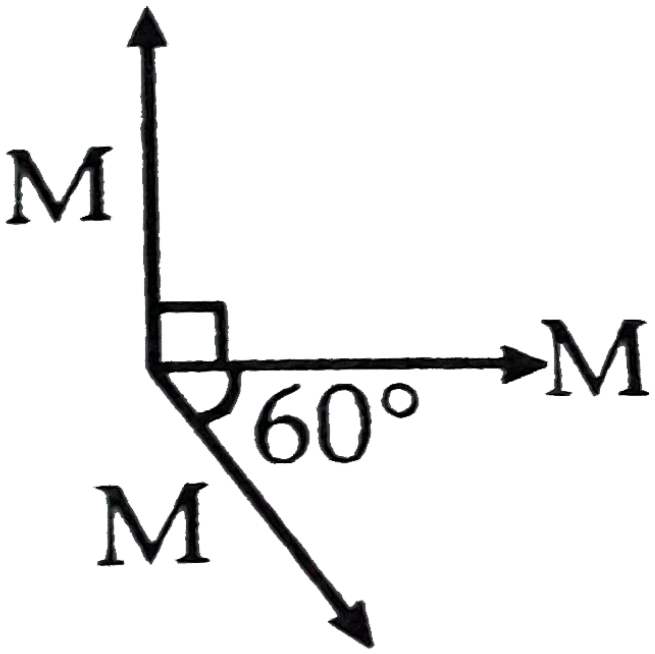
196. The resultant magnetic moment for the following arrangement is



A. M

B. 1.5M

C. 3M

D. 4M

Answer: B

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197. A thin "bar" magnet of length $'l'$ and magnetic moment $'M'$ is bent at the mid point so that the two parts are at right angles.

The new magnetic length and magnetic moment are respectively

A. $\frac{1}{\sqrt{2}}, \frac{M}{\sqrt{2}}$

B. $\sqrt{2l}, \sqrt{2M}$

C. $\frac{l}{\sqrt{2}}, \sqrt{M}$

D. $\sqrt{2l}, \frac{M}{\sqrt{2}}$

Answer: A

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198. Two magnets have their lengths in the ratio $2:3$ and their pole strength in the ratio $3:4$. The ratio of their magnetic moment is

A. $4:1$

B. $1:2$

C. $1:4$

D. $2:1$

Answer: B

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199. A bar magnet of moment M is bent to the letter "L" shape a position that divides the length in the ratio $1:2$.Its new magnetic moment becomes

A. $\frac{3M}{5}$

B. $\frac{\sqrt{5}}{3}M$

C. $\frac{5}{6}M$

D. $\frac{\sqrt{3}}{5}M$

Answer: B

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200. If the moment of a magnet is $0.4Am^{-1}$ and force seting on esch pote in a uniform magnetic field of induction $3.2 \times 10^{-5}\mathrm{Wb/m^2}$ is $5.12 \times 10^{-5}N,$ the dstance berween the poles of magnet is

A. 25 cm

B. 16cm

C. 12.5cm

D. 12cm

Answer: A

Watch Video Solution

201. The magnetic moment of a bar magnet of geometric length 20 cm is $3.6 \times 10^{-6} Am^2$ The magnetic length is 90% of its geometric length the pole strength is

A. $2 \times 10^{-5} Am$

B. $1.8 \times 10^{-4} Am$

C. $7.2 \times 10^{-8} Am$

D. $0.55 \times 10^{-4} Am$

Answer: A

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202. Each pole of magnet of length 20 cm in a magnetic field of induction 0.2 T experiences a force 20 N. The magnetic moment of magnet is

A. $20 Am^2$

B. $15Am^2$

C. $10Am^2$

D. $5Am^2$

Answer: A

Watch Video Solution

203. Two bar magnets of magnetic moments $12Am^2$ and $10Am^2$ are placed one over the other .First with their similar poles in contact

after unlike poles in contact.The ratio of their resultant magnetic moments is

A. $5:6$

B. $6:5$

C. $11:1$

D. $10:12$

Answer: C

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204. A bar magnet of magnetic moment M_1 is axially cut into two equal parts. If these two pieces are arranged perpendiucular to each other, the resultant magnetic moment is M_2. Then the vale of $\frac{M_1}{M_2}$ is

A. $1:\sqrt{2}$

B. $1:1$

C. $\sqrt{2}:1$

D. $1:2$

Answer: C

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205. Two magnetic poles one of which is three times as strong as the other exert on each other a force equal to 150 mg wt when placedd 5 cm apart in air.The stregth of the stronger pole is

A. 1.7 Am

B. 3.5 AM

C. 6.3 Am

D. 10.5Am

Answer: D

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206. The force experienced by a pole of strength 100 Am at a distance of 0.2 m from a short magnet of length 5 cm and pole strength of 200 Am on its axial line will be

A. $5 \times 10^{-2} N$

B. $2.5 \times 10^{-2} N$

C. $3.5 \times 10^{-4} N$

D. $5 \times 10^{-4} N$

Answer: A

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207. The magnetic induction due to a bar magnet of length $6 \times 10^{-2} m$ and pole strength $5 \times 10^{-3} Am$ at a point 0.1 m away from the centre and along the equator

A. $3 \times 10^{-8} N/ampm$

B. $3 \times 10^{-10} N/ampm$

C. $(1/3) \times 10^{-7} N/ampm$

D. $5 \times 10^{-10} N/ampm$

Answer: A

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208. At a point on the exial of a magnet,the magnetic at a induction is found to be 80 μT

.The induction at a point on its equatorial line at twice the distance of the first point will be

A. $10\mu T$

B. $5\mu T$

C. $20\mu T$

D. $40\mu T$

Answer: B

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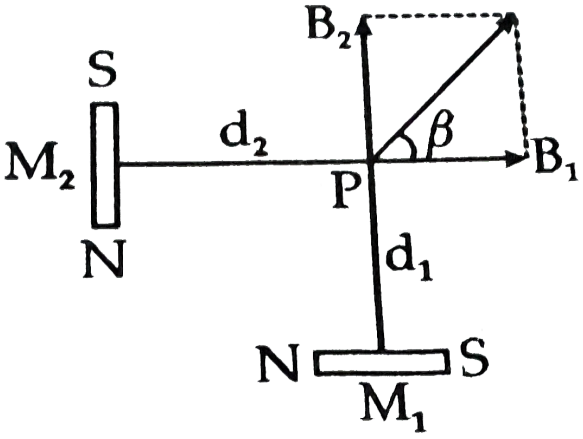
209. Two short magnets of magnetic moment M_1 and M_2 are fixed on a table as shown.What will be the direction and magnitude of magnetic induction produced by these magnets at the point 'P' $\left(M_1 2.7 Am^2 = 3.2 Am^2, d_1 = 0.3m, d_2 = 0.4m\right)$



A. $10.04 \times 10^{-7} T, \tan^1(2)$

B. $11.04 \times 10^{-7} T, \tan^{1}(2)$

C. $111.8 \times 10^{-7} T, \tan^{-1}(1/2)$

D. $13.04 \times 10^{-7} T, \tan^{1}(2)$

Answer: C

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210. A magnet of magnetic moment M of length 22 cm is bent into a semicircle.Now the magnetic moment is

A. 11/7 M

B. 7/11M

C. 14M

D. 22M

Answer: B

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211. Two poles seprated by 10 cm experiences a force on mN.Find the force between them

when the distance is doubled and the pole strengths are doubled.

A. 5mN

B. 10mN

C. 2.5mN

D. 1 mN

Answer: A

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212. A bar magnet is suspended in a uniform magnetic field in a position such that it experiences maximum torque. The angle through which it must be rotated from this position such that it experiences half of the maximum torque.

A. 60°

B. 30°

C. 90°

D. 45°

Answer: A

Watch Video Solution

213. The magnetic potential at a point distant 10 cm from the middle point of a magnetic dipole on a line inclined at an angle of60° with the axis is 3 e.m.u Then the magnetic moment of magnet is

A. 600 ab ampcm^2

B. 300 ab amp cm^2

C. 150 ab ampcm^2

D. 300 $\sqrt{3}$ ab amo cm^2

Answer: A

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214. Two isolated point poles of strength 30 Am and 60 Am are placed a distance of 0.3 m.The force of repulsion is

A. $2 \times 10^{-3} N$

B. $3 \times 10^{-2} N$

C. $4 \times 10^{-3} N$

D. $3 \times 10^{-4} N$

Answer: A

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215. A short bar magnet placed with its axis at 30° with a uniform external magnetic field of 0.35 T experiences a torque of magnitude

equal to $4.5 \times 10^{-2} Nm$. The magnitude of magnetic moment of the given magnet is

A. 1.36 J/T

B. 0.06 J/T

C. 0.36 J/T

D. 0.60 J/T

Answer: C

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216. A bar magnet 8 cm long is placed in the magnetic meridian with the N pole pointing toward geographical north.Two neutral points separated by a distance of 6 cm are obtained on the equatorial axis of the magnet.If horizontal component of earth's field is $3.2 \times 10^{-5} T$,then pole strength of magnet is

A. 5 ab amp cm

B. 3 ab amp cm

C. 7 ab amp cm

D. 2 ab amp cm

Answer: B

View Text Solution

217. The intensity of magnetic field is H and moment of magnet is M. The maximum potential energy is

A. MB

B. 2MB

C. 3MB

D. 4MB

Answer: A

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218. If a magnet of length $10cm$ and pole strength $40A - m$ is placed at an angle of 45° in an uniform induction field of intensity $2 \times 10^{-4}T$, the couple acting on it is

A. $0.5656 \times 10^4 Nm$

B. $0.5656 \times 10^{-3} Nm$

C. $0.65 \times 10^{-4} Nm$

D. $0.66 \times 10^4 Nm$

Answer: B

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219. At neutral point,the horizontal component of the magnetic field due to a magnet is

A. equal to earth's horizontal magnetic field

B. in the same direction of the earth's horizontal magnetic field

C. in the opposite direction of the earth's horizontal magnetic field

D. Both 'a' and 'c'

Answer: D

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220. If a substance moves from stronger part to weaker part of the non uniform magnetic field than the substance is

A. Diamagnetic

B. Paramagnetic

C. Ferromagnetic

D. antiferromagnetic

Answer: A

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221. Consider a sort magnetic dipole o f magnetic length 10cm. Find its geometric length.

A. 12 cm

B. 10 cm

C. 8 cm

D. 14 cm

Answer: A

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222. Angle of dip is zero at

A. Poles

B. equator

C. between poles of equator

D. none of these

Answer: B

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223. A magnet with moment M is given. If it is bent into a semicircular form, its new magnetic moment will be:

A. M

B. 2M

C. $2M/\pi$

D. $M/2\pi$

Answer: C

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224. Magnetic field B_1 due to abar magnet at a point P on axial line is equal to magnetic field B_2 due to the same magnet at point Q on equatorial line.What ios the ratio distances of point P and Q from centre?

A. $2^{-1/3}$

B. 2

C. $2^{1/3}$

D. $1/2$

Answer: C

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225. A wire of length l, carrying current i, is bent in circle of radius r, then magnetic moment at centre of loop is

A. $Il^2 / 2\pi$

B. $Il^2 / 4\pi$

C. I

D. l

Answer: B

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226. 1 Tesla =

A. 1 Wb/m

B. 1J/Am

C. 1N/Am

D. 1Am/N

Answer: C

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227. Potential due to magnetic dipole at distance from centre of the dipole on axis of dipole is V.What will be potential at distance 2r from centre on the axis of dipole?

A. V/2

B. V/4

C. 2V

D. 4V

Answer: B

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228. The bar magnet produces magnetic induction of $4 \times 10^{-5} T$ at a point 10 cm from centre on the axis of magnet.The magnetic moment is

A. $0.2 Am^2$

B. $0.002 Am^2$

C. $2 Am^2$

D. $0.02 Am^2$

Answer: A

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229. Which of the following is the most suitable material for making permanent magnet ?

A. Brass

B. nickel

C. Aluminium

D. copper

Answer: B

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230. Direction of magnetic field at equatorial point

A. Parallel to $\overrightarrow{M}$

B. Perpendicular to $\overrightarrow{M}$

C. Making an angle of 45° with $\overrightarrow{M}$

D. Antiparallel to $\overrightarrow{M}$

Answer: D

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231. Consider a sort magnetic dipole o f magnetic length 10cm. Find its geometric length.

A. 12 cm

B. 10cm

C. 8cm

D. 14cm

Answer: A

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232. Direction of magnetic field at equatorial point

A. Antiparallel to magnetic moment

B. Parallel to magnetic moment

C. Perpendicular to magnetic moment

D. Arbitrary depended on a distance of a point fro centre of the magnet

Answer: A

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233. An iron rod of length L and magnetic moment M is bent in the form of a semicircle. Now its magnetic moment will be

A. 4M

B. M/4

C. $2M/\pi$

D. 2M

Answer: C

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234. A wire of length $Lmetre$, carrying a current Iampere is bent in the form of a circle . The magnitude of its magnetic moment is ..... $MKSunits$.

A. $\frac{iL}{4\pi}$

B. $\frac{i^2L}{4\pi}$

C. $\frac{iL^2}{4\pi}$

D. $\frac{iL^2}{4}$

Answer: C

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235. A magnet of length $2l$ and pole strength m is equally divided in two parts,

perpendicular to its length. What is the magnetic moment of each?

A. zero

B. M/2

C. Making an angle of 45° with $\vec{M}$

D. 2M

Answer: B

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236. Magnetic potential at a point due to a short magnetic dipole of moment 2 Am^2 at a distance of 100 cm along a line making an angle of 60° with the axis is $\left(\mu_0 = 4\pi \times 10^{-7} Wb/Am\right)$

A. $\sqrt{3} \times 10^{-7} J/Am$

B. $1 \times 10^{-7} J/Am$

C. $\sqrt{3} \times 10^{-11} J/Am$

D. $1 \times 10^{-9} J/Am$

Answer: B

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237. On applying an external magnetic field , to a ferromagnetic substance domains

A. Align in the direction of magnetic field

B. Align in the opposite direction of magnetic field

C. remain undefled

D. None of these

Answer: A

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238. The magnetic moment produced in a substance of $1gmis6 \times 10^{-7}$ ampere, metre^2. If its density is $5gm/cm^3$, then the intensity of magnetisation in A/m will be

A. 8.3×10^6

B. 3.0

C. 1.2×10^{-7}

D. 13×10^{-6}

Answer: B

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239. If the magnet is cut into four equal parts such that their lengths and breadths are equal . Pole strength of each part is

A. m

B. $\frac{m}{2}$

C. $\frac{m}{4}$

D. $\frac{m}{8}$

Answer: B

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240. At a point on the right bisector of a magnetic dipole the magnetic potential

A. potential varies as $\frac{1}{r^2}$

B. Potential is zero at all points on the right bisector

C. field varies as r^2

D. Field is perpendicular to the axis of dipole

Answer: A

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241. A circular coil of radius r is fromed by wire of length L.If current I is flowing through it then the magnetic moment Is proportional to

A. L^2

B. L

C. L^3

D. $L^{1/2}$

Answer: A

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242. The wire of length L is bent in the form of square and circle.The ratio of their magnetic moment at their centre is

A. $\pi/4$

B. $\pi/6$

C. $\pi/2$

D. π

Answer: A

Watch Video Solution

243. Two wires of same length are shaped into a square and a circle. If they carry same current, ratio of the magnetic moment is

A. $(\pi/2)$

B. $(\pi/3)$

C. $(\pi/8)$

D. $(\pi/4)$

Answer: D

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244. Magnetic moment of an electron of charge e moving in a circular orbit of radius r with speed `v is given by

A. (evr)

B. (evr/4)

C. (evr/2)

D. (evr/8)

Answer: C

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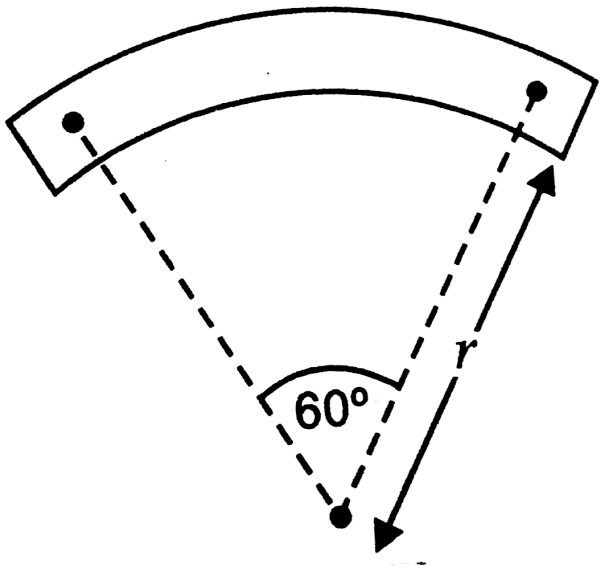
245. A bar magnet of lenth l and magnetic dipole moment 'M' is bent in the form of an arc as shown in figure. The new magnetic dipole moment will be



A. $\frac{3}{\pi}M$

B. $\frac{2}{\pi}M$

C. $\frac{M}{2}$

D. M

Answer: A

Watch Video Solution

246. The ratio of magnetic dipole moment to angular momentum of electron is

A. $\frac{e}{m}$

B. $\frac{m}{e}$

C. $\frac{2m}{e}$

D. $\frac{e}{2m}$

Answer: D

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247. Electromagnets are made of soft iron because soft iron has

A. High susceptibility and low retentivity

B. low susceptibility and high retentivity

C. low susceptibility and low retentivity

D. High susceptibility and high retentivity

Answer: A

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248. For dimgnetic materials magnetic susceptibility is

A. small and negative

B. small and positive

C. large and negative

D. large and positive

Answer: A

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249. A coil carrying current I has radius r and number of turns n it is rewound so that radis of new coil is $\frac{r}{4}$ and it carries current I the

ratio fo magenic moment of new coil to that of original coil is

A. 1

B. $\frac{1}{2}$

C. $\frac{1}{4}$

D. $\frac{1}{8}$

Answer: C

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