EdLoop JEE

PHYSICS · JEE MAIN

Magnetism & Matter

Previous Year Questions with answers

80 questions · **68** papers · **2003–2026** · newest paper first

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What is in this PDF: every Magnetism & Matter question we hold from past JEE Main and AIEEE papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

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Chapter at a glance

1.2%
of Physics questions, 2019–2026

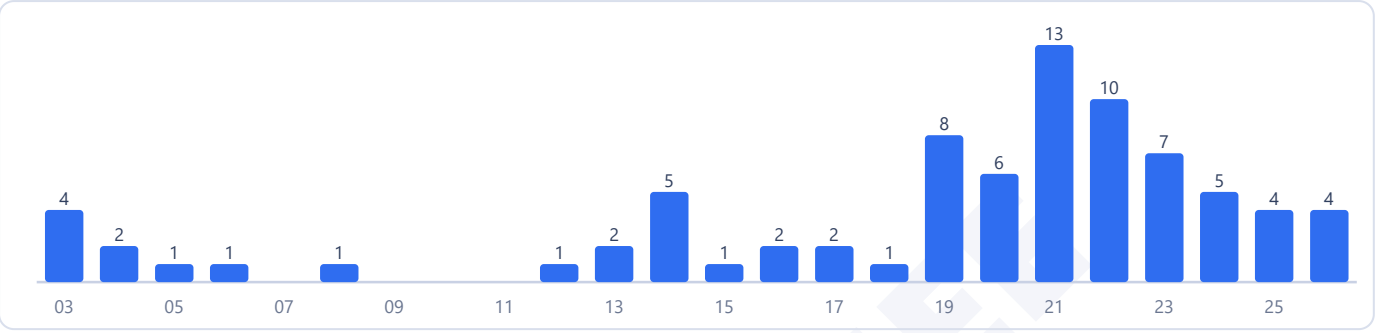
80
questions, 2003–2026

50 of 162
papers asked it, 2019–2026

70 / 10
MCQ / numerical, 2003–2026

Trend. Falling: 0.2 questions per paper in 2024–2026 against 0.4 in 2019–2023.

Questions per year



Counts are the questions we hold: 80 in 68 papers. No question in this chapter was found repeated across papers.

Most-asked topics in this chapter (2003–2026)

Magnetic Materials	41
Bar Magnet	28
Earth's Magnetism	11

How often it comes up

Magnetism and matter covers magnetic materials and bar magnets under Unit 13: Magnetic Effects of Current and Magnetism in the Class 12 physics curriculum, placing the chapter at rank 28 among the 29 physics chapters. In the computerized testing interval from 2019 to 2026, 57 questions appeared across 162 papers, representing an average of 0.4 questions per shift. The chapter featured in 50 of those 162 papers, and questions have been asked every year across that span. Examining the recent 2024 to 2026 cycle shows 13 questions across 58 papers, an average of 0.2 questions per test and a 0.8 percent share. The chapter's share is down when compared against the 2002 to 2018 period, which recorded 23 questions across 38 papers for a 1.7 percent share. Relative to the broader 2019 to 2026 baseline, the recent share has stayed about the same. In 2026 specifically, 4 questions were distributed across 19 papers, appearing in 3 testing sessions. Between 2019 and 2026, exactly 10 problems were presented in numerical answer format, with the majority of questions remaining conceptual multiple choice items.

Most-asked topics

Questions from this chapter center on three distinct subject divisions:

- **Magnetic Materials**: 41 total questions since 2003, with 32 between 2019 and 2026, tested up to 2026. This topic explores the properties of diamagnetic, paramagnetic, and ferromagnetic materials, domain theory, Curie temperature, magnetic susceptibility, and the relation between permeability and susceptibility.
- **Bar Magnet**: 28 questions overall, including 16 from 2019 to 2026, continuing in 2026. Problems evaluate magnetic dipole moments, axial and equatorial fields of short bar magnets, torque in external fields, potential energy of orientation, and work done rotating a dipole from stable to unstable alignment.
- **Earth's Magnetism**: 11 lifetime questions, with 9 appearing between 2019 and 2026, last tested in 2023. Core themes analyze magnetic elements of the Earth, including angle of dip, declination, and horizontal and vertical field components.

What the questions look like

Exam questions in this chapter are largely conceptual, with occasional compact numerical evaluations:

- **Classification of magnetic media**: Identifying differences in magnetic susceptibility across diamagnetic, paramagnetic, and ferromagnetic substances, or determining behavior in non-uniform magnetic fields.
- **Rotating a bar magnet**: Calculating the mechanical work necessary to flip a permanent magnet from its equilibrium position aligned with an external field to the anti-parallel configuration.
- **Relations between field vectors**: Connecting magnetic induction B, magnetic intensity H, and magnetization M within a solenoid core of known relative permeability.
- **Dip needle and compass oscillations**: Evaluating how the time period of an oscillating magnetic needle varies with the horizontal component of the terrestrial field across differing dip angles.

How to practise it

Begin by thoroughly learning the definitions and relationships connecting magnetic induction, magnetic field intensity, magnetization, and susceptibility. Ensure you know the exact algebraic connections and SI units for each quantity, as unit matching questions appear regularly.

Memorize the distinctive characteristics of diamagnetic, paramagnetic, and ferromagnetic materials. Pay attention to how susceptibility depends on temperature for each class, particularly Curie's law for paramagnets and the Curie-Weiss law near the transition temperature.

For bar magnet problems, draw analogies to electric dipoles. The formulas for magnetic field along the axis and the broadside-on position correspond directly to electric dipole equations when replacing permittivity with magnetic permeability.

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Q1 JEE Main 2026 · 4 Apr · Shift 2 MCQ

A solenoid has a core made of material with relative permeability 400. The magnetic field produced in the interior of solenoid is 1.0 T. The magnetic intensity in SI units is $\alpha \times 10^5$. The value of α is _____.

(Free space permeability $\mu_0 = 4\pi \times 10^{-7}$ SI units.)

(A) $\frac{25}{\pi}$
(B) $\frac{1}{16\pi}$
(C) $\frac{1}{\pi}$
(D) $\frac{1}{4\pi}$

Answer: (B) $\frac{1}{16\pi}$ · Official NTA final key

Q2 JEE Main 2026 · 4 Apr · Shift 2 Numerical

Two identical small bar magnets each of dipole moment $3\sqrt{5}$ J/T are placed at a center to center separation of 10 cm, with their axes perpendicular to each other as shown in figure. The value of magnetic field at the point P midway between the magnets is $\alpha \times 10^{-3}$ T. The value of α is _____.

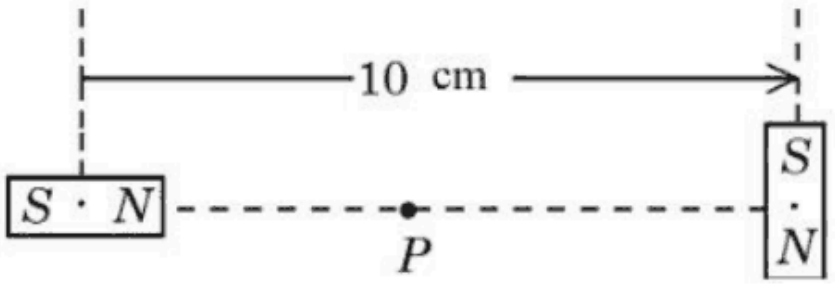
($\mu_0 = 4\pi \times 10^{-7}$ Tm/A)

(see the figure above)

Inscript

Two identical small bar magnets each of dipole moment $3\sqrt{5}$ J/T are placed at a center to center separation of 10 cm, with their axes perpendicular to each other as shown in figure. The value of magnetic field at the point P midway between the magnets is $\alpha \times 10^{-3}$ T. The value of α is _____.

($\mu_0 = 4\pi \times 10^{-7}$ Tm/A)



Numerical value type: the answer is a number.

Answer: 12. · Official NTA final key

Q3 JEE Main 2026 · 24 Jan · Shift 1 Numerical

A short bar magnet placed with its axis at 30° with an external field of 800 Gauss, experiences a torque of 0.016 N.m. The work done in moving it from most stable to most unstable position is $\alpha \times 10^{-3}$ J. The value of α is _____.

Numerical value type: the answer is a number.

Answer: 64. · Official NTA final key

Q4 JEE Main 2026 · 23 Jan · Shift 1 MCQ

Given below are two statements : one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Consider a ferromagnetic material :

Assertion (A) : The individual atoms in a ferromagnetic material possess a magnetic dipole moment and interact with one another in such a way that they spontaneously align themselves forming domains.

Reason (R) : At high enough temperature, the domain structure of ferromagnetic material disintegrates. Thus, magnetization will disappear at high enough temperature known as Curie temperature.

In the light of the above statements, choose the **correct answer** from the options given below :

(A) (A) is false but (R) is true
(B) Both (A) and (R) are true but (R) is **not** the correct explanation of (A)
(C) Both (A) and (R) are true and (R) is the correct explanation of (A)
(D) (A) is true but (R) is false

Answer: (B) Both (A) and (R) are true but (R) is **not** the correct explanation of (A) · Official NTA final key

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Q5 JEE Main 2025 · 7 Apr · Shift 1 MCQ

The percentage increase in magnetic field (B) when space within a current carrying solenoid is filled with magnesium (magnetic susceptibility $\chi_{Mg} = 1.2 \times 10^{-5}$) is :

(A) $\frac{5}{6} \times 10^{-4}\%$
(B) $\frac{6}{5} \times 10^{-3}\%$
(C) $\frac{5}{3} \times 10^{-5}\%$
(D) $\frac{5}{6} \times 10^{-5}\%$

Answer: (B) $\frac{6}{5} \times 10^{-3}\%$ · Key from source paper

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Q6 JEE Main 2025 · 7 Apr · Shift 2 MCQ

Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A) : Magnetic monopoles do not exist.

Reason (R): Magnetic field lines are continuous and form closed loops.

In the light of the above statements, choose the most appropriate answer from the options given below :

(A) (A) is correct but (R) is not correct
(B) Both (A) and (R) are correct and (R) is the correct explanation of (A)
(C) (A) is not correct but (R) is correct
(D) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

Answer: (B) Both (A) and (R) are correct and (R) is the correct explanation of (A) · Key from source paper

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Q7 JEE Main 2025 · 2 Apr · Shift 1 MCQ

The relationship between the magnetic susceptibility (χ) and the magnetic permeability (μ) is given by : (μ_0 is the permeability of free space and μ_r is relative permeability)

(A) $\chi = \mu_r + 1$
(B) $X = \frac{\mu_r}{\mu_0} + 1$
(C) $\chi = 1 - \frac{\mu}{\mu_0}$
(D) $\chi = \frac{\mu}{\mu_0} - 1$

Answer: (D) $\chi = \frac{\mu}{\mu_0} - 1$ · Key from source paper

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Q8 JEE Main 2025 · 29 Jan · Shift 2 MCQ

Match List - I with List - II.

List - I	List - II
(A) Magnetic induction	(I) Ampere meter^2
(B) Magnetic intensity	(II) Weber
(C) Magnetic flux	(III) Gauss
(D) Magnetic moment	(IV) Ampere/meter

(A) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
(B) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)
(C) (A)-(III), (B)-(II), (C)-(I), (D)-(IV)
(D) (A)-(III), (B)-(IV), (C)-(II), (D)-(I)

Answer: (D) (A)-(III), (B)-(IV), (C)-(II), (D)-(I) · Key from source paper

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Q9 JEE Main 2024 · 9 Apr · Shift 2 Numerical

A straight magnetic strip has a magnetic moment of 44Am^2. If the strip is bent in a semicircular shape, its magnetic moment will be _____ Am^2. (given $\pi = \frac{22}{7}$)

Numerical value type: the answer is a number.

Answer: 28. · Key from source paper

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Q10 JEE Main 2024 · 8 Apr · Shift 1 MCQ

Paramagnetic substances: A. align themselves along the directions of external magnetic field. B. attract strongly towards external magnetic field. C. has susceptibility little more than zero. D. move from a region of strong magnetic field to weak magnetic field. Choose the most appropriate answer from the options given below:

(A) A, B, C Only
(B) A, B, C, D
(C) A, C Only
(D) B, D Only

Answer: (C) A, C Only · Key from source paper

Q11 JEE Main 2024 · 8 Apr · Shift 2 Numerical

The coercivity of a magnet is 5×10^3 A/m. The amount of current required to be passed in a solenoid of length 30 cm and the number of turns 150 , so that the magnet gets demagnetised when inside the solenoid is _____ A.

Numerical value type: the answer is a number.

Answer: 10. · Key from source paper

Q12 JEE Main 2024 · 4 Apr · Shift 2 MCQ

The magnetic moment of a bar magnet is $0.5\ \mathrm{Am}^2$. It is suspended in a uniform magnetic field of 8×10^{-2} T. The work done in rotating it from its most stable to most unstable position is:

(A) 8×10^{-2} J
(B) 4×10^{-2} J
(C) Zero
(D) 16×10^{-2} J

Answer: (A) 8×10^{-2} J · Key from source paper

Q13 JEE Main 2024 · 29 Jan · Shift 1 Numerical

The magnetic potential due to a magnetic dipole at a point on its axis situated at a distance of 20 cm from its center is 1.5×10^{-5} T m. The magnetic moment of the dipole is _____ A m^2. (Given : $\frac{\mu_0}{4\pi} = 10^{-7}$ T m A^{-1})

Numerical value type: the answer is a number.

Answer: 6. · Key from source paper

Q14 JEE Main 2023 · 12 Apr · Shift 1 MCQ

Given below are two statements:
Statement I : The diamagnetic property depends on temperature.

Statement II : The induced magnetic dipole moment in a diamagnetic sample is always opposite to the magnetising field.

In the light of given statements, choose the correct answer from the options given below

(A) Both Statement I and Statement II are False

(B) Statement I is incorrect but Statement II is true

(C) Statement I is correct but Statement II is false

(D) Both Statement I and Statement II are true

Answer: (B) Statement I is incorrect but Statement II is true · Key from source paper

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Q15 JEE Main 2023 · 12 Apr · Shift 1 Numerical

A compass needle oscillates 20 times per minute at a place where the dip is 30° and 30 times per minute where the dip is 60°. The ratio of total magnetic field due to the earth at two places respectively is $\frac{4}{\sqrt{x}}$. The value of x is

Numerical value type: the answer is a number.

Answer: 243. · Key from source paper

Q16 JEE Main 2023 · 11 Apr · Shift 1 MCQ

The free space inside a current carrying toroid is filled with a material of susceptibility 2×10^{-2}. The percentage increase in the value of magnetic field inside the toroid will be

(A) 0.2%

(B) 0.1%

(C) 2%

(D) 1%

Answer: (C) 2% · Key from source paper

Q17 JEE Main 2023 · 10 Apr · Shift 2 MCQ

Given below are two statements:

Statement I: For diamagnetic substance $-1 \leq x < 0$, where x is the magnetic susceptibility.

Statement II: Diamagnetic substance when placed in an external magnetic field, tend to move from stronger to weaker part of the field. In the light of the above statements, choose the correct answer from the options give below.

(A) Both Statement I and Statement II are False

(B) Statement I is correct but Statement II is false

(C) Statement I is incorrect but Statement II is true

(D) Both Statement I and Statement II are true

Answer: (D) Both Statement I and Statement II are true · Key from source paper

Q18 JEE Main 2023 · 8 Apr · Shift 2 MCQ

Given below are two statements: one is labelled as **Assertion A** and the other is labelled as **Reason R**.

Assertion A : Electromagnets are made of soft iron.

Reason R : Soft iron has high permeability and low retentivity.

In the light of above statements, choose the most appropriate answer from the options given below.

(A) **A** is not correct but **R** is correct
(B) **A** is correct but **R** is not correct
(C) Both **A** and **R** are correct and **R** is the correct explanation of **A**
(D) Both **A** and **R** are correct but **R** is NOT the correct explanation of **A**

Answer: (C) Both A and R are correct and R is the correct explanation of A · Key from source paper

Q19 JEE Main 2023 · 31 Jan · Shift 1 MCQ

A bar magnet with a magnetic moment 5.0 $\mathrm{A\ m^2}$ is placed in parallel position relative to a magnetic field of 0.4 T. The amount of required work done in turning the magnet form parallel to antiparallel position relative to the field direction is _____.

(A) 4 J
(B) 1 J
(C) 2 J
(D) Zero

Answer: (A) 4 J · Key from source paper

Q20 JEE Main 2023 · 31 Jan · Shift 1 MCQ

A rod with circular cross-section area 2 $\mathrm{cm^2}$ and length 40 cm is wound uniformly with 400 turns of an insulated wire. If a current of 0.4 A flows in the wire windings, the total magnetic flux produced inside windings is $4\pi \times 10^{-6}\ \mathrm{Wb}$. The relative permeability of the rod is
(Given : Permeability of vacuum $\mu_0 = 4\pi \times 10^{-7}\ \mathrm{N\ A^{-2}}$)

(A) 12.5
(B) $\frac{32}{5}$
(C) 125
(D) $\frac{5}{16}$

Answer: (C) 125 · Key from source paper

Q21 JEE Main 2022 · 29 Jul · Shift 2 MCQ

The vertical component of the earth's magnetic field is 6×10^{-5} T at any place where the angle of dip is 37°. The earth's resultant magnetic field at that place will be (Given $\tan 37^\circ = \frac{3}{4}$)

(A) 8×10^{-5} T
(B) 6×10^{-5} T
(C) 5×10^{-4} T
(D) 1×10^{-4} T

Answer: (D) 1×10^{-4} T · Key from source paper

Q22 JEE Main 2022 · 27 Jul · Shift 1 MCQ

A magnet hung at 45° with magnetic meridian makes an angle of 60° with the horizontal. The actual value of the angle of dip is

(A) $\tan^{-1}\left(\sqrt{\frac{3}{2}}\right)$
(B) $\tan^{-1}\left(\sqrt{6}\right)$
(C) $\tan^{-1}\left(\sqrt{\frac{2}{3}}\right)$
(D) $\tan^{-1}\left(\sqrt{\frac{1}{2}}\right)$

Answer: (A) $\tan^{-1}\left(\sqrt{\frac{3}{2}}\right)$ · Key from source paper

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Q23 JEE Main 2022 · 27 Jul · Shift 1 MCQ

Two bar magnets oscillate in a horizontal plane in earth's magnetic field with time periods of 3 s and 4 s respectively. If their moments of inertia are in the ratio of 3 : 2 then the ratio of their magnetic moments will be

(A) 2 : 1
(B) 8 : 3
(C) 1 : 3
(D) 27 : 16

Answer: (B) 8 : 3 · Key from source paper

Q24 JEE Main 2022 · 27 Jul · Shift 2 MCQ

A compass needle of oscillation magnetometer oscillates 20 times per minute at a place P of dip 30°. The number of oscillations per minute become 10 at another place Q of 60° dip. The ratio of the total magnetic field at the two places ($B_Q : B_P$) is:

(A) $\sqrt{3} : 4$
(B) $4 : \sqrt{3}$
(C) $\sqrt{3} : 2$
(D) $2 : \sqrt{3}$

Answer: (A) $\sqrt{3} : 4$ · Key from source paper

Q25 JEE Main 2022 · 29 Jun · Shift 1 MCQ

At a certain place the angle of dip is 30° and the horizontal component of earth's magnetic field is $0.5\ \mathrm{G}$. The earth's total magnetic field (in G), at that certain place, is

(A) $\frac{1}{\sqrt{3}}$
(B) $\frac{1}{2}$
(C) $\sqrt{3}$
(D) 1

Answer: (A) $\frac{1}{\sqrt{3}}$ · Key from source paper

Q26 JEE Main 2022 · 28 Jun · Shift 2 MCQ

The space inside a straight current carrying solenoid is filled with a magnetic material having magnetic susceptibility equal to 1.2×10^{-5}. What is fractional increase in the magnetic field inside solenoid with respect to air as medium inside the solenoid?

(A) 1.2×10^{-5}
(B) 1.2×10^{-3}
(C) 1.8×10^{-3}
(D) 2.4×10^{-5}

Answer: (A) 1.2×10^{-5} · Key from source paper

Q27 JEE Main 2022 · 27 Jun · Shift 1 MCQ

The susceptibility of a paramagnetic material is 99. The permeability of the material in $\mathrm{Wb}/\mathrm{A}-\mathrm{m}$, is [Permeability of free space $\mu_0 = 4\pi \times 10^{-7}\ \mathrm{Wb}/\mathrm{A}-\mathrm{m}$]

(A) $4\pi \times 10^{-5}$
(B) $4\pi \times 10^{-6}$
(C) $4\pi \times 10^{-7}$
(D) $4\pi \times 10^{-4}$

Answer: (A) $4\pi \times 10^{-5}$ · Key from source paper

Q28 JEE Main 2022 · 26 Jun · Shift 2 MCQ

A bar magnet having a magnetic moment of $2.0 \times 10^5\ \mathrm{J\ T^{-1}}$, is placed along the direction of uniform magnetic field of magnitude $B = 14 \times 10^{-5}\ \mathrm{T}$. The work done in rotating the magnet slowly through 60° from the direction of field is

(A) $14\ \text{J}$
(B) $8\ \text{J}$
(C) $4\ \text{J}$
(D) $1.4\ \text{J}$

Answer: (A) $14\ \text{J}$ · Key from source paper

Q29 JEE Main 2022 · 25 Jun · Shift 2 MCQ

Given below are two statements :
Statement - I : Susceptibilities of paramagnetic and ferromagnetic substances increase with decrease in temperature.
Statement - II : Diamagnetism is a result of orbital motions of electrons developing magnetic moments opposite to the applied magnetic field.
Choose the correct answer from the options given below

(A) Both Statement - I and Statement - II are true.
(B) Both Statement - I and Statement - II are false.
(C) Statement - I is true but Statement - II is false.
(D) Statement- I is false but Statement - II is true.

Answer: (A) Both Statement - I and Statement - II are true. · Key from source paper

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Q30 JEE Main 2022 · 24 Jun · Shift 2 MCQ

The soft-iron is a suitable material for making an electromagnet. This is because soft-iron has

(A) low coercivity and high retentivity.
(B) low coercivity and low permeability.
(C) high permeability and low retentivity.
(D) high permeability and high retentivity.

Answer: (C) high permeability and low retentivity. · Key from source paper

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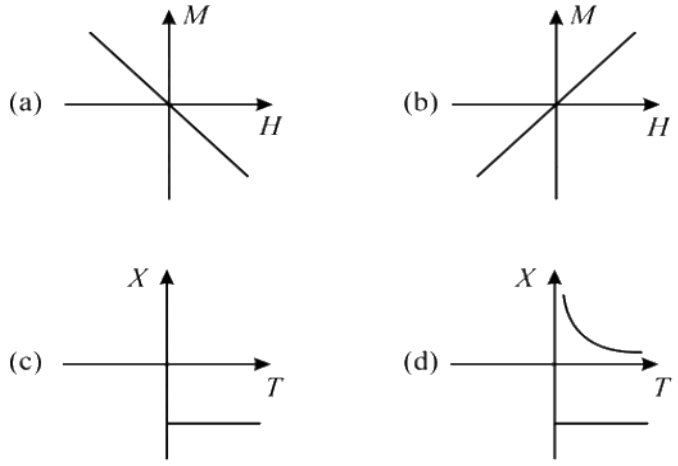
Q31 JEE Main 2021 · 1 Sep · Shift 2 MCQ

Following plots show Magnetization (M) vs Magnetising field (H) and Magnetic susceptibility (χ) vs Temperature (T) graph :
(see the figure above)
Which of the following combination will be represented by a diamagnetic material?

Q14. Following plots show Magnetization (M) vs Magnetising field (H) and Magnetic susceptibility (χ) vs Temperature (T) graph :



Which of the following combination will be represented by a diamagnetic material?

(1) (b), (c)
(2) (b), (d)
(3) (a), (d)
(4) (a), (c)

(A) (b), (c)
(B) (b), (d)
(C) (a), (d)
(D) (a), (c)

Answer: (D) (a), (c) · Key from source paper

Q32 JEE Main 2021 · 31 Aug · Shift 2 Numerical

A long solenoid with 1000 turns m^{-1} has a core material with relative permeability 500 and volume 10^3 cm^3. If the core material is replaced by another material having relative permeability of 750 with same volume maintaining same current of 0.75 A in the solenoid, the fractional change in the magnetic moment of the core would be approximately $\frac{x}{499}$. Find the value of x.

Numerical value type: the answer is a number.

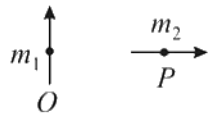
Answer: 250. · Key from source paper

Q33 JEE Main 2021 · 26 Aug · Shift 1 Numerical

Two short magnetic dipoles m_1 and m_2 each having magnetic moment of $1\ \mathrm{A\ m^2}$ are placed at point O and P respectively. The distance between OP is $1\ \mathrm{m}$. The torque experienced by the magnetic dipole m_2 due to the presence of m_1 is _____$\times 10^{-7}\ \mathrm{N\ m}$

(see the figure above)

Q27. Two short magnetic dipoles m_1 and m_2 each having magnetic moment of $1\ \text{A m}^2$ are placed at point O and P respectively. The distance between OP is $1\ \text{m}$. The torque experienced by the magnetic dipole m_2 due to the presence of m_1 is _____ $\times 10^{-7}\text{N m}$



Numerical value type: the answer is a number.

Answer: 1. · Key from source paper

Q34 JEE Main 2021 · 27 Jul · Shift 1 Numerical

In a uniform magnetic field, the magnetic needle has a magnetic moment $9.85 \times 10^{-2}\ \text{A m}^{-2}$ and moment of inertia $5 \times 10^{-6}\ \text{kg m}^2$. If it performs 10 complete oscillations in 5 seconds then the magnitude of the magnetic field is _____ mT [Take π^2 as 9.85]

Numerical value type: the answer is a number.

Answer: 8. · Key from source paper

Q35 JEE Main 2021 · 25 Jul · Shift 1 Numerical

The value of aluminium susceptibility is 2.2×10^{-5}. The percentage increase in the magnetic field in space within a current carrying toroid is filled with aluminium is $\frac{x}{10^4}$. Then the value of x is

Numerical value type: the answer is a number.

Answer: 22. · Key from source paper

Q36 JEE Main 2021 · 22 Jul · Shift 1 MCQ

Statement I : The ferromagnetic property depends on temperature. At high temperature, ferromagnet becomes paramagnet.
Statement II : At high temperature, the domain wall area of a ferromagnetic substance increases. In the light of the above statements, choose the most appropriate answer from the options given below:

(A) Statement I is true but Statement II is false.
(B) Both Statement I and Statement II are true.
(C) Both Statement I and Statement II are false.
(D) Statement I is false but Statement II is true.

Answer: (A) Statement I is true but Statement II is false. · Key from source paper

Q37 JEE Main 2021 · 22 Jul · Shift 1 MCQ

Choose the correct option.

(A) True dip is not mathematically related to apparent dip.
(B) True dip is less than apparent dip.
(C) True dip is always greater than the apparent dip.
(D) True dip is always equal to apparent dip.

Answer: (B) True dip is less than apparent dip. · Key from source paper

Q38 JEE Main 2021 · 20 Jul · Shift 2 MCQ

At an angle of 30° to the magnetic meridian, the apparent dip is 45°. Find the true dip.

(A) $\tan^{-1}\sqrt{3}$
(B) $\tan^{-1}\frac{1}{\sqrt{3}}$
(C) $\tan^{-1}\frac{2}{\sqrt{3}}$
(D) $\tan^{-1}\frac{\sqrt{3}}{2}$

Answer: (D) $\tan^{-1}\frac{\sqrt{3}}{2}$ · Key from source paper

Q39 JEE Main 2021 · 20 Jul · Shift 2 MCQ

The magnetic susceptibility of a material of a rod is 499. Permeability in vacuum is $4\pi \times 10^{-7}\ \mathrm{Hm}^{-1}$. Absolute permeability of the material of the rod is

(A) $4\pi \times 10^{-4}\ \mathrm{Hm}^{-1}$
(B) $2\pi \times 10^{-4}\ \mathrm{Hm}^{-1}$
(C) $3\pi \times 10^{-4}\ \mathrm{Hm}^{-1}$
(D) $\pi \times 10^{-4}\ \mathrm{Hm}^{-1}$

Answer: (B) $2\pi \times 10^{-4}\ \mathrm{Hm}^{-1}$ · Key from source paper

Q40 JEE Main 2021 · 18 Mar · Shift 2 MCQ

Which of the following statements are correct?
(A) Electric monopoles do not exist whereas magnetic monopoles exist.
(B) Magnetic field lines due to a solenoid at its ends and outside cannot be completely straight and confined.
(C) Magnetic field lines are completely confined within a toroid.
(D) Magnetic field lines inside a bar magnet are not parallel.
(E) $\chi = -1$ is the condition for a perfect diamagnetic material, where χ is its magnetic susceptibility.
Choose the correct answer from the options given below :

(A) (C) and (E) only
(B) (B) and (D) only
(C) (A) and (B) only
(D) (B) and (C) only

Options (1) or (4) were accepted. More than one answer was accepted. · Key from source paper

Q41 JEE Main 2021 · 16 Mar · Shift 1 MCQ

A bar magnet of length $14\ \text{cm}$ is placed in the magnetic meridian with its north pole pointing towards the geographic north pole. A neutral point is obtained at a distance of $18\ \text{cm}$ from the center of the magnet. If $B_H = 0.4\ \text{G}$, the magnetic moment is $\left(1\text{G} = 10^{-4}\ \text{T}\right)$

(A) $2.880 \times 10^{3}\ \text{J T}^{-1}$
(B) $2.880 \times 10^{2}\ \text{J T}^{-1}$
(C) $2.880\ \text{J T}^{-1}$
(D) $28.80\ \text{J T}^{-1}$

Answer: (C) $2.880\ \text{J T}^{-1}$ · Key from source paper

Q42 JEE Main 2021 · 25 Feb · Shift 2 MCQ

In a ferromagnetic material, below the curie temperature, a domain is defined as:

(A) a macroscopic region with saturation magnetization.
(B) a macroscopic region with consecutive magnetic dipoles oriented in opposite direction.
(C) a macroscopic region with zero magnetization.
(D) a macroscopic region with randomly oriented magnetic dipoles.

Answer: (A) a macroscopic region with saturation magnetization. · Key from source paper

Q43 JEE Main 2021 · 24 Feb · Shift 2 MCQ

A soft ferromagnetic material is placed in an external magnetic field. The magnetic domains:

(A) have no relation with external magnetic field.
(B) decrease in size and changes orientation.
(C) increase in size but no change in orientation.
(D) may increase or decrease in size and change its orientation.

Answer: (D) may increase or decrease in size and change its orientation. · Key from source paper

Q44 JEE Main 2020 · 5 Sep · Shift 2 MCQ

An iron rod of volume 10^{-3} m^3 and relative permeability 1000 is placed as core in a solenoid with 10 turns cm^{-1}. If a current of 0. 5 A is passed through the solenoid, then the magnetic moment of the rod will be :

(A) 50×10^2 Am^2
(B) 5×10^2 Am^2
(C) 500×10^2 Am^2
(D) 0.5×10^2 Am^2

Answer: (B) 5×10^2 Am^2 · Key from source paper

Q45 JEE Main 2020 · 4 Sep · Shift 1 MCQ

A small bar magnet is placed with its axis at 30° with an external magnetic field of 0.06 T experiences a torque of 0.018 Nm. The minimum work required to rotate it from its stable to unstable equilibrium position is:

(A) 6.4×10^{-2} J
(B) 9.2×10^{-3} J
(C) 7.2×10^{-2} J
(D) 11.7×10^{-3} J

Answer: (C) 7.2×10^{-2} J · Key from source paper

Q46 JEE Main 2020 · 4 Sep · Shift 2 MCQ

A paramagnetic sample shows a net magnetisation of $6\ A/m$ when it is placed in an external magnetic field of $0.4\ T$ at a temperature of $4\ K$. When the sample is placed in an external magnetic field of $0.3\ T$ at a temperature of $24\ K$, then the magnetisation will be :

(A) $1\ A/m$
(B) $4\ A/m$
(C) $2.25\ A/m$
(D) $0.75\ A/m$

Answer: (D) $0.75\ A/m$ · Key from source paper

Q47 JEE Main 2020 · 3 Sep · Shift 2 MCQ

A perfectly diamagnetic sphere has a small spherical cavity at its centre, which is filled with a paramagnetic substance. The whole system is placed in a uniform magnetic field $\vec{B}$. Then the field inside the paramagnetic substance is:
(see the figure above)

Q14. A perfectly diamagnetic sphere has a small spherical cavity at its centre, which is filled with a paramagnetic substance. The whole system is placed in a uniform magnetic field $\vec{B}$. Then the field inside the paramagnetic substance is:



(1) $\vec{B}$

(2) Zero

(3) much large than $|\vec{B}|$ and parallel to $\vec{B}$

(4) much large than $|\vec{B}|$ but opposite to $\vec{B}$

(A) $\vec{B}$

(B) Zero

(C) much large than $|\vec{B}|$ and parallel to $\vec{B}$

(D) much large than $|\vec{B}|$ but opposite to $\vec{B}$

Answer: (B) Zero · Key from source paper

Q48 JEE Main 2020 · 2 Sep · Shift 1 MCQ

Magnetic materials used for making permanent magnets (P) and magnets in a transformer (T) have different properties of the following, which property best matches for the type of magnet required?

(A) T : Large retentivity, small coercivity

(B) P : small retentivity, large coercivity

(C) T : Large retentivity, large coercivity

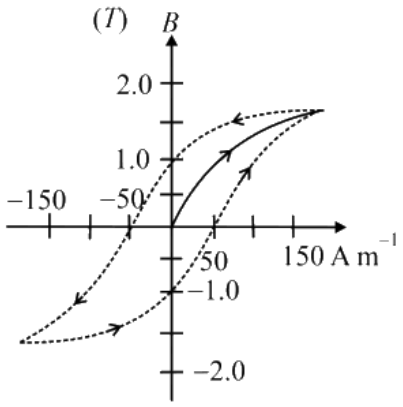
(D) P : large retentivity, large coercivity

Answer: (D) P : large retentivity, large coercivity · Key from source paper

Q49 JEE Main 2020 · 7 Jan · Shift 2 MCQ

see figure

Q13.



The figure gives experimentally measured B vs. H variation in a ferromagnetic material. The retentivity, coercivity and saturation, respectively, of the material are:

(1) $1.5\text{T}, 50\text{A/m}$ and 1.0T
(2) $1.5\text{T}, 50\text{A/m}$ and 1.0T
(3) $150\text{A/m}, 1.0\text{T}$ and 1.5T
(4) $1.0\text{T}, 50\text{A/m}$ and 1.5T

(A) $1.5\text{T}, 50\text{A/m}$ and 1.0T
(B) $1.5\text{T}, 50\text{A/m}$ and 1.0T
(C) $150\text{A/m}, 1.0\text{T}$ and 1.5T
(D) $1.0\text{T}, 50\text{A/m}$ and 1.5T

Answer: (D) $1.0\text{T}, 50\text{A/m}$ **and** 1.5T · Key from source paper

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Q50 JEE Main 2019 · 12 Apr · Shift 1 MCQ

A magnetic compass needle oscillates 30 times per minute at a place where the dip is 45° and 40 times per minute where the dip is 30°. If B_1 and B_2 are the net magnetic fields due to the earth at the two places respectively, then the ratio $B_1 \ / \ B_2$ is approximately equal to

(A) 3.6
(B) 1.8
(C) 1.2
(D) 0.7

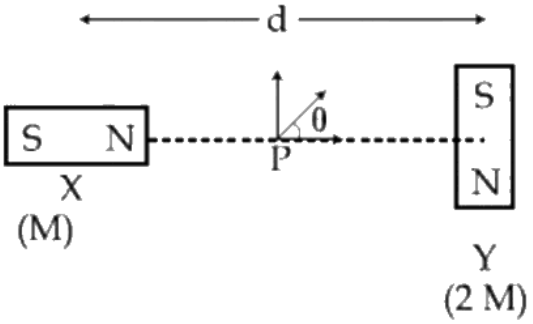
Answer: (D) 0.7 · Key from source paper

Q51 JEE Main 2019 · 8 Apr · Shift 2 MCQ

Two magnetic dipoles X and Y are placed at a separation d , with their axes perpendicular to each other. The dipole moment of Y is twice that of X . A particle of charge q is passing through their mid-point P , at angle $\theta = 45^o$ with the horizontal line, as shown in figure. What would be the magnitude of force on the particle at that instant? (d is much larger than the dimension of the dipole)

(see the figure above)

Q22. Two magnetic dipoles X and Y are placed at a separation d , with their axes perpendicular to each other. The dipole moment of Y is twice that of X . A particle of charge q is passing through their mid-point P , at angle $\theta = 45^{o}$ with the horizontal line, as shown in figure. What would be the magnitude of force on the particle at that instant? (d is much larger than the dimension of the dipole)



(1) 0

(2) $\sqrt{2}\,\frac{\mu_0}{4\pi}\frac{M}{\frac{d^3}{2}} \times qv$

(3) $\frac{\mu_0}{4\pi}\frac{M}{\frac{d^3}{2}} \times qv$

(4) $\frac{\mu_0}{4\pi}\frac{2M}{\frac{d^3}{2}} \times qv$

(A) 0

(B) $\sqrt{2}\,\frac{\mu_0}{4\pi}\frac{M}{\frac{d^3}{2}} \times qv$

(C) $\frac{\mu_0}{4\pi}\frac{M}{\frac{d^3}{2}} \times qv$

(D) $\frac{\mu_0}{4\pi}\frac{2M}{\frac{d^3}{2}} \times qv$

Answer: (A) 0 · Key from source paper

Q52 JEE Main 2019 · 12 Jan · Shift 2 MCQ

A paramagnetic material has 10^{28} atoms m^{-3}. Its magnetic susceptibility at temperature 350 K is 2.8×10^{-4}. Its susceptibility at 300 K is

(A) $3.726 \text{ x } 10^{-4}$

(B) $2.672 \text{ x } 10^{-4}$

(C) $3.267 \text{ x } 10^{-4}$

(D) $3.672 \text{ x } 10^{-4}$

Answer: (C) $3.267 \text{ x } 10^{-4}$ · Key from source paper

Q53 JEE Main 2019 · 11 Jan · Shift 2 MCQ

A paramagnetic substance in the form of a cube with sides 1 cm has a magnetic dipole moment of 20×10^{-6} J/T when a magnetic intensity of 60×10^{3} A/m is applied. Its magnetic susceptibility is:

(A) 3.3×10^{-2}
(B) 4.3×10^{-2}
(C) 2.3×10^{-2}
(D) 3.3×10^{-4}

Answer: (D) 3.3×10^{-4} · Key from source paper

Q54 JEE Main 2019 · 10 Jan · Shift 1 MCQ

A magnet of total magnetic moment $10^{-2}\,\hat{i}$ A m^2 is placed in a time varying magnetic field, $B\hat{i}(\cos\omega t)$ where $B = 1$ Tesla and $\omega = 0.125$ rad s^{-1}. The work done for reversing the direction of the magnetic moment at $t = 1$ second, is:

(A) 0.007 J
(B) 0.02 J
(C) 0.014 J
(D) 0.01 J

Answer: (B) 0.02 J · Key from source paper

Q55 JEE Main 2019 · 10 Jan · Shift 2 MCQ

A hoop and a solid cylinder of same mass and radius are made of a permanent magnetic material with their respective axes. But the magnetic moment of hoop is twice of solid cylinder. They are placed in a uniform magnetic field in such a manner that their magnetic moments make a small angle with the field. If the oscillation periods of hoop and cylinder are T_h and T_c respectively, then:

(A) $T_h = 2T_c$
(B) $T_h = T_c$
(C) $T_h = 0.5T_c$
(D) $T_h = 1.5T_c$

Answer: (B) $T_h = T_c$ · Key from source paper

Q56 JEE Main 2019 · 10 Jan · Shift 2 MCQ

At some location the horizontal component of earth's magnetic field is 18×10^{-6} T. At this location, magnetic needle of length 0.12 m and pole strength 1.8 Am is suspended from its mid-point using a thread, it makes 45° angles with horizontal in equilibrium. To keep this needle horizontal, the vertical force that should be applied at one of its ends is:

(A) 1.8×10^{-5} N
(B) 3.6×10^{-5} N
(C) 6.5×10^{-5} N
(D) 1.3×10^{-5} N

Answer: (C) 6.5×10^{-5} N · Key from source paper

Q57 JEE Main 2019 · 9 Jan · Shift 1 MCQ

A bar magnet is demagnetized by inserting it inside a solenoid of length $0.2\ m$, 100 turns, and carrying a current of $5.2\ A$. The coercivity of the bar magnet is:

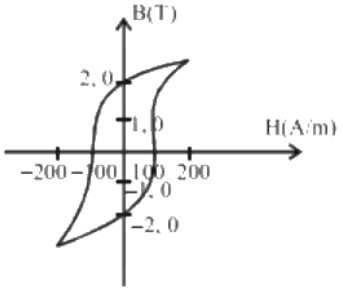
(A) $285\ A\ /\ m$
(B) $2600\ A\ /\ m$
(C) $520\ A\ /\ m$
(D) $1200\ A\ /\ m$

Answer: (B) $2600\ A\ /\ m$ · Key from source paper

Q58 JEE Main 2018 · 15 Apr · Shift 1 MCQ

The B-H curve for a ferromagnet is shown in the figure. The ferromagnet is placed inside a long solenoid with 1000 turns/cm.. The current that should be passed in the solenoid to demagnetize the ferromagnet completely is:
(see the figure above)

Q18. The B-H curve for a ferromagnet is shown in the figure. The ferromagnet is placed inside a long solenoid with 1000 turns/cm.. The current that should be passed in the solenoid to demagnetize the ferromagnet completely



is:
(1) 2 mA
(2) 1 mA
(3) 40μA
(4) 20μA

(A) 2 mA
(B) 1 mA
(C) 40μA
(D) 20μA

Answer: (B) 1 mA · Key from source paper

Q59 JEE Main 2017 · 8 Apr · Online · MCQ

A magnetic dipole in a uniform magnetic field has: (Take zero potential energy when magnetic dipole is perpendicular to magnetic field)

(A) Maximum potential energy when the torque is maximum
(B) Zero potential energy when the torque is maximum
(C) Zero potential energy when the torque is minimum
(D) Minimum potential energy when the torque is maximum

Answer: (B) Zero potential energy when the torque is maximum · Key from source paper

Q60 JEE Main 2017 · 2 Apr · Offline · MCQ

A magnetic needle of magnetic moment $6.7 \times 10^{-2}\ \mathrm{A\ m^2}$ and moment of inertia $7.5 \times 10^{-6}\ \mathrm{kg\ m^2}$ is performing simple harmonic oscillations in a magnetic field of $0.01\ \mathrm{T}$. Time taken for 10 complete oscillations is:

(A) $8.76\ \mathrm{s}$
(B) $6.65\ \mathrm{s}$
(C) $8.89\ \mathrm{s}$
(D) $6.98\ \mathrm{s}$

Answer: (B) $6.65\ \mathrm{s}$ · Key from source paper

Q61 JEE Main 2016 · 9 Apr · Online · MCQ

A magnetic dipole is acted upon by two magnetic fields which are inclined to each other at an angle of 75°. One of the fields has a magnitude of $15\ \mathrm{mT}$. The dipole attains stable equilibrium at an angle of 30° with this field. The magnitude of the other field (in mT) is close to

(A) 1
(B) 11
(C) 36
(D) 1060

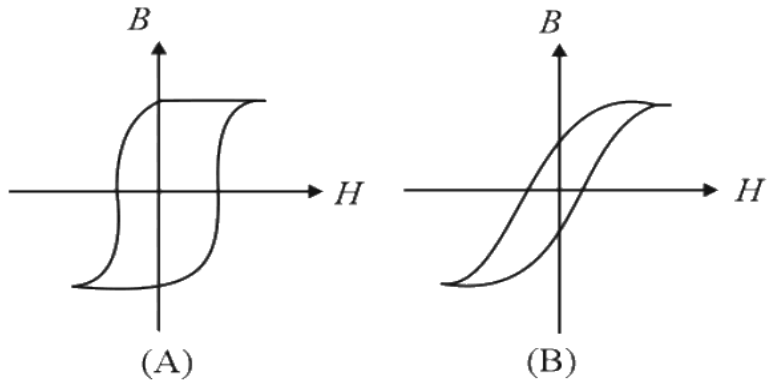
Answer: (B) 11 · Key from source paper

Q62 JEE Main 2016 · 3 Apr · Offline · MCQ

Hysteresis loops for two magnetic materials A and B are given below:
(see the figure above)
These materials are used to make magnets for electric generators, transformer core and electromagnet core. Then it is proper to use:

EdLoop JEE

Q16. Hysteresis loops for two magnetic materials A and B are given below:



These materials are used to make magnets for electric generators, transformer core and electromagnet core. Then it is proper to use:

(1) A for transformers and B for electric generators.

(2) B for electromagnets and transformers.

(3) A for electric generators and transformers.

(4) A for electromagnets and B for electric generators.

(A) A for transformers and B for electric generators.

(B) B for electromagnets and transformers.

(C) A for electric generators and transformers.

(D) A for electromagnets and B for electric generators.

Answer: (B) B for electromagnets and transformers. · Key from source paper

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Q63 JEE Main 2015 · 11 Apr · Online MCQ

A short bar magnet is placed in the magnetic meridian of the earth with North Pole pointing north. Neutral points are found at a distance of 30 cm from the magnet on the East-West line, drawn through the middle point of the magnet. The magnetic moment of the magnet in Am^2 is close to: (Given $\frac{\mu_0}{4\pi} = 10^{-7}$ in SI units and B_H = Horizontal component of earth's magnetic field = 3.6×10^{-5} Tesla.)

(A) 4.9

(B) 14.6

(C) 19.4

(D) 9.7

Answer: (D) 9.7 · Key from source paper

Q64 JEE Main 2014 · 19 Apr · Online MCQ

An example of a perfect diamagnet is a superconductor. This implies that when a superconductor is put in a magnetic field of intensity B, the magnetic field B_s inside the superconductor will be such that

(A) $B_s = B.$

(B) $B_s = 0.$

(C) $B_s < B$ but $B_s \neq 0.$

(D) $B_s = -B$

Answer: (B) $B_s = 0.$ · Key from source paper

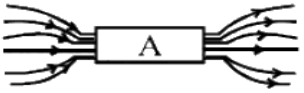
Q65 JEE Main 2014 · 11 Apr · Online MCQ

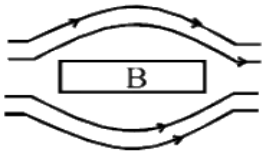
Three identical bars A, B and C are made of different magnetic materials. When kept in a uniform magnetic field, the field lines around them look as follows:

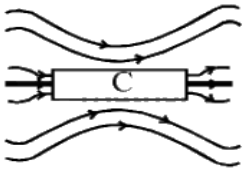
(see the figure above)

Make the correspondence of these bars with their material being diamagnetic (D), ferromagnetic (F) and paramagnetic (P) :

Q20. Three identical bars A, B and C are made of different magnetic materials. When kept in a uniform magnetic field, the field lines around them look as follows:







Make the correspondence of these bars with their material being diamagnetic (D), ferromagnetic (F) and paramagnetic (P) :

(1) $\mathrm{A} \leftrightarrow \mathrm{D}, \mathrm{B} \leftrightarrow \mathrm{P}, \mathrm{C} \leftrightarrow \mathrm{F}$

(2) $\mathrm{A} \leftrightarrow \mathrm{F}, \mathrm{B} \leftrightarrow \mathrm{D}, \mathrm{C} \leftrightarrow \mathrm{P}$

(3) $\mathrm{A} \leftrightarrow \mathrm{P}, \mathrm{B} \leftrightarrow \mathrm{F}, \mathrm{C} \leftrightarrow \mathrm{D}$

(4) $\mathrm{A} \leftrightarrow \mathrm{F}, \mathrm{B} \leftrightarrow \mathrm{P}, \mathrm{C} \leftrightarrow \mathrm{D}$

(A) $\mathrm{A} \leftrightarrow \mathrm{D}, \mathrm{B} \leftrightarrow \mathrm{P}, \mathrm{C} \leftrightarrow \mathrm{F}$

(B) $\mathrm{A} \leftrightarrow \mathrm{F}, \mathrm{B} \leftrightarrow \mathrm{D}, \mathrm{C} \leftrightarrow \mathrm{P}$

(C) $\mathrm{A} \leftrightarrow \mathrm{P}, \mathrm{B} \leftrightarrow \mathrm{F}, \mathrm{C} \leftrightarrow \mathrm{D}$

(D) $\mathrm{A} \leftrightarrow \mathrm{F}, \mathrm{B} \leftrightarrow \mathrm{P}, \mathrm{C} \leftrightarrow \mathrm{D}$

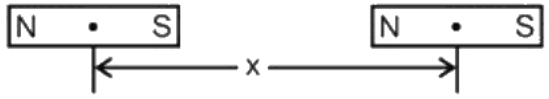
Answer: (B) $\mathrm{A} \leftrightarrow \mathrm{F}, \mathrm{B} \leftrightarrow \mathrm{D}, \mathrm{C} \leftrightarrow \mathrm{P}$ · Key from source paper

Q66 JEE Main 2014 · 9 Apr · Online MCQ

The mid points of two small magnetic dipoles of length d in end-on positions, are separated by a distance x ($x \gg d$). The magnitude of force between them is proportional to x^{-n} where n is :

(see the figure above)

Q19. The mid points of two small magnetic dipoles of length d in end-on positions, are separated by a distance x $(x \gg d)$. The magnitude of force between them is proportional to x^{-n} where n is :



(1) 3
(2) 4
(3) 2
(4) 1

(A) 3
(B) 4
(C) 2
(D) 1

Answer: (B) 4 · Key from source paper

Q67 JEE Main 2014 · 9 Apr · Online MCQ

The magnetic field of earth at the equator is approximately $4 \times 10^{-5}\mathrm{T}$. The radius of earth is $6.4 \times 10^{6}\mathrm{m}$. Then the dipole moment of the earth will be nearly of the order of :

(A) $10^{20}\ \mathrm{A\,m^2}$
(B) $10^{16}\ \mathrm{A\,m^2}$
(C) $10^{10}\ \mathrm{A\,m^2}$
(D) $10^{23}\ \mathrm{A\,m^2}$

Answer: (D) $10^{23}\ \mathrm{A\,m^2}$ · Key from source paper

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Q68 JEE Main 2014 · 6 Apr · Offline MCQ

The coercivity of a small magnet, where the ferromagnet gets demagnetised is 3×10^3 A/m. The current required to be passed in a solenoid of length 10 cm and number of turns 100, so that the magnet gets demagnetised when inside the solenoid is

(A) 30 mA
(B) 60 mA
(C) 3 A
(D) 6 A

Answer: (C) 3 A · Key from source paper

Q69 JEE Main 2013 · 25 Apr · Online MCQ

The earth's magnetic field lines resemble that of a dipole at the centre of the earth. If the magnetic moment of this dipole is close to $8 \times 10^{22}\ \mathrm{Am^2}$, the value of earth's magnetic field near the equator is close to (radius of the earth $= 6.4 \times 10^6$ m)

(A) 0.6 Gauss
(B) 1.2 Gauss
(C) 1.8 Gauss
(D) 0.32 Gauss

Answer: (D) 0.32 Gauss · Checked by our team

Q70 JEE Main 2013 · 7 Apr · Offline MCQ

Two short bar magnets of length 1 cm each have magnetic moments 1.20 $\mathrm{A\ m^2}$ and 1.00 $\mathrm{A\ m^2}$ respectively. They are placed on a horizontal table parallel to each other with their N poles pointing towards the south. They have a common magnetic equator and are separated by a distance of 20.0 cm. The value of the resultant horizontal magnetic induction at the mid-point O of the line joining their centres is close to (Horizontal component of earth's magnetic induction is $3.6 \times 10^{-5}\ \mathrm{Wb\ m^{-2}}$)

(A) $3.50 \times 10^{-4}\ \mathrm{Wb\ m^{-2}}$
(B) $5.80 \times 10^{-4}\ \mathrm{Wb\ m^{-2}}$
(C) $3.6 \times 10^{-5}\ \mathrm{Wb\ m^{-2}}$
(D) $2.56 \times 10^{-4}\ \mathrm{Wb\ m^{-2}}$

Answer: (D) $2.56 \times 10^{-4}\ \mathrm{Wb\ m^{-2}}$ · Key from source paper

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Q71 AIEEE 2012 · 7 May · Online MCQ

A bar magnet of length 6 cm has a magnetic moment of 4 $\mathrm{J\ T^{-1}}$. Find the strength of magnetic field at a distance of 200 cm from the centre of the magnet along its equatorial line.

(A) 4×10^{-8} tesla
(B) 3.5×10^{-8} tesla
(C) 5×10^{-8} tesla
(D) 3×10^{-8} tesla

Answer: (C) 5×10^{-8} tesla · Key from source paper

Q72 AIEEE 2008 MCQ

Relative permittivity and permeability of a material are ε_r and μ_r, respectively. Which of the following values of these quantities are allowed for a diamagnetic material?

(A) $\varepsilon_r = 0.5,\ \mu_r = 1.5$
(B) $\varepsilon_r = 1.5,\ \mu_r = 0.5$
(C) $\varepsilon_r = 0.5,\ \mu_r = 0.5$
(D) $\varepsilon_r = 1.5,\ \mu_r = 1.5$

Answer: (B) $\varepsilon_r = 1.5,\ \mu_r = 0.5$ · Key from source paper

Q73 AIEEE 2006 MCQ

Needles N_1, N_2 and N_3 are made of a ferromagnetic, a paramagnetic and a diamagnetic substance respectively. A magnet when brought close to them will

(A) attract all three of them
(B) attract N_1 and N_2 strongly but repel N_3
(C) attract N_1 strongly, N_2 weakly and repel N_3 weakly
(D) attract N_1 strongly, but repel N_2 and N_3 weakly

Answer: (C) attract N_1 strongly, N_2 weakly and repel N_3 weakly · Key from source paper

Q74 AIEEE 2005 MCQ

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

(A) a torque but not a force
(B) neither a force nor a torque
(C) a force and a torque.
(D) a force but not a torque.

Answer: (C) a force and a torque. · Key from source paper

Q75 AIEEE 2004 MCQ

The length of a magnet is large compared to its width and breadth. The time period of its width and breadth. The time period of its oscillation in a vibration magnetometer is 2 s. The magnet is cut along its length into three equal parts and three parts are then placed on each other with their like poles together. The time period of this combination will be

(A) 2 s
(B) 2/3 s
(C) $2\sqrt{3}$ s
(D) $2/\sqrt{3}$ s

Answer: (B) 2/3 s · Key from source paper

Q76 AIEEE 2004 MCQ

The materials suitable for making electromagnets should have

(A) high retentivity and high coercivity
(B) low retentivity and low coercivity
(C) high retentivity and low coercivity
(D) low retentivity and high coercivity

Answer: (B) low retentivity and low coercivity · Key from source paper

EdLoop JEE

Q77 AIEEE 2003 MCQ

A thin rectangular magnet suspended freely has a period of oscillation equal to T. Now it is broken into two equal halves (each having half of the original length) and one piece is made to oscillate freely in the same field. If its period of oscillation is T', the ratio $\frac{T'}{T}$ is

(A) $\frac{1}{2\sqrt{2}}$
(B) $\frac{1}{2}$
(C) 2
(D) $\frac{1}{4}$

Answer: (B) $\frac{1}{2}$ · Key from source paper

Q78 AIEEE 2003 MCQ

A magnetic needle lying parallel to a magnetic field requires W units of work to turn it through 60°. The torque needed to maintain the needle in this position will be

(A) $\sqrt{3}$ W
(B) W
(C) $\frac{\sqrt{3}}{2}$ W
(D) 2 W

Answer: (A) $\sqrt{3}$ W · Key from source paper

Q79 AIEEE 2003 MCQ

The magnetic lines of force inside a bar magnet

(A) are from north-pole to south-pole of the magnet
(B) do not exist
(C) depend upon the area of cross-section of the bar magnet
(D) are from south-pole to north-pole of the magnet

Answer: (D) are from south-pole to north-pole of the magnet · Key from source paper

Q80 AIEEE 2003 MCQ

Curie temperature is the temperature above which

(A) a ferromagnetic material becomes paramagnetic
(B) a paramagnetic material becomes diamagnetic
(C) a ferromagnetic material becomes diamagnetic
(D) a paramagnetic material becomes ferromagnetic

Answer: (A) a ferromagnetic material becomes paramagnetic · Key from source paper

EdLoop JEE