



PHYSICS

BOOKS - MBD -HARYANA BOARD

MAGNETISM

Very Short Answer Type Questions

1. (a) What happens if a bar magnet is cut into two pieces : (i) transverse to its length. (ii) along its length?



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2. What happens if a bar magnet is cut into two pieces : (i) transverse to its lengths, (ii) along its length ?



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3. What is magnetic flux ? Write its SI unit. Explain its relation with magnetic field lines using diagram.



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4. Define the term magnetic permeability (μ) and write its unit.



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5. What is the difference between magnetic length and length of magnet ?



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6. The law which states that the variations of electric field causes magnetic field is

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7. What is the probable cause of earth's magnetism?

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8. State and explain Curie law in magnetism.

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9. What are the magnetic elements of earth?

Explain them briefly?



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10. Define the term angle of dip and declination.



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11. Name the elements or parameters of earth's magnetic field.



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12. Define the term retentivity and coercivity.



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13. What is Hysteresis loop ? Explain with the help of terms related to it.



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14. (a) What happens if a bar magnet is cut into two pieces (i) transverse to its length (ii) along its length?

(b) What happens if an iron bar magnet is melted? Does it retain its magnetism?

(c) A magnetised needle in a uniform magnetic field experiences a torque but no net force.

However, an iron nail near a bar magnet experiences a force of attraction in addition to a torque, explain.

(d) Must every magnetic field configuration have a north pole and a south pole? What about the field due to a toroid?

(e) Can you think of magnetic field configuration with three poles?

(f) Two identical looking iron bars A and B are given, one of which is definitely known to be magnetised. How would one ascertain whether or not both are magnetised? If only one is magnetised how does one ascertain which one? Use nothing else but the bars A and B.



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15. Distinguish between dia and para magnetic substances.



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16. Which of the following is independent quantities is no used to specify the earth's magnetic field?



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17. The torque acting on a magnet of magnetic moment 'M' placed in a uniform magnetic field B is



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18. Calculate potential energy of a magnetic dipole in a magnetic field.



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19. Define different types of magnetic materials and give one example in each case.



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20. Why cannot two magnetic lines of forces due to a bar magnet cross each other ?



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21. Write the relation between relative permeability and susceptibility.



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22. Two identical-looking iron bars A and B are given, one of which is definitely known to be magnetized. (We do not know which one). How would one ascertain whether or not both are magnetized ? If only one is magnetized, how

does one ascertain which one ? [Use nothing else but the two bars A and B]



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23. Magnetic susceptibility of a paramagnetic substance is



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24. What is the value of relative magnetic permeability of perfectly diamagnetic

substance ?



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25. Susceptibility of ferromagnetic substance
is



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26. SI unit of magnetic flux is



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Short Answer Type Questions

1. Derive an expression for potential energy of a bar magnet when placed in an external magnetic field.



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2. Show how a current loop acts as a magnetic dipole. Derive an expression for its magnetic moment.



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3. What are the uses of studying hysteresis curve of substance ?



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4. What would be your consideration while making electromagnets ?



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Long Answer Type Questions

1. Name and define elements of earth's magnetism.



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2. Explain the three magnetic elements of earth at a place.



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3. Define angle of dip. Deduce the relation connecting angle of dip and horizontal component of earth's magnetic field at a place.



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4. Discuss atom as a magnetic dipole. Hence define Bohr magneton.



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5. Derive an expression for magnetic dipole moment of a revolving electron.

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6. (a) What do you mean by Hysteresis ?
Explain.

(b) Discuss some uses of the study of hysteresis studies.

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7. Explain the magnetic hysteresis loop ? What are its uses ?



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Objective Type Questions

1. The vertical component of earth's magnetic field is zero at a place where angle of dip is :

A. 0°

B. 45°

C. 60°

D. 90°

Answer: A



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2. A steel wire of length l has a magnetic moment M . It is bent into L shape from the middle. The new magnetic moment is :

A. M

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

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

D. $2M$

Answer: B



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3. The relative permeability of a medium is 0.075. What is its magnetic susceptibility?

A. 0.926

B. -0.925

C. 1.075

D. -1.075

Answer: B



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4. Direction of induced emf is given by :

A. Maxwell's law

B. Kirchhoff's law

C. Lenz's law

D. Ampere's law

Answer: C



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5. To produce a magnetic field of π tesla at the centre of circular loop of diameter 1 m, the current flowing through loop is :

A. $5 \times 10^6 A$

B. $10^7 A$

C. $2.5 \times 10^6 A$

D. $2 \times 10^6 A$

Answer: C



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6. The magnetic susceptibility of a ferromagnetic substance is :

A. large and positive

B. small and positive

C. small and negative

D. large and negative

Answer: A



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7. The magnetic lines of force inside a bar magnet :

A. do not exist

B. depends on area of cross-section of the
bar magnet

C. are from N-pole to S-pole of the magnet

D. are from S-pole to N-pole of the magnet

Answer: D



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8. The ratio of magnetic potentials due to magnetic dipole in the end on position to that

in broad on position for the same distance
from it is :

A. 0

B. ∞

C. 1

D. 2

Answer: B



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9. The vertical component of earth's magnetic field is zero at :

A. magnetic equator

B. magnetic pole

C. geographic pole

D. at 90° latitude

Answer: A



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10. Magnetic susceptibility of diamagnetic substance is :

A. small and negative

B. small and positive

C. large and negative

D. large and positive

Answer: A



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11. A long wire carries a steady current. It is bent into a circle of one turn and the magnetic field at the centre of the coil is B . It is then bent into a circular loop of n turns. The magnetic field at the centre of the coil will be

A. nB

B. $2n^2B$

C. $2nB$

D. n^2B

Answer: A



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12. Magnetic susceptibility of diamagnetic substance is :

A. Small and negative

B. Small and positive

C. Large and positive

D. None

Answer: A



13. An aeroplane with wingspan 50 m is flying horizontally with a speed of 360kmh^{-1} over a place where the vertical component of the earth's magnetic field is $2 \times 10^{-4}\text{Wbm}^{-2}$. The potential difference between the tips of the wings would be :

A. 0.1 V

B. 1.0 V

C. 0.2 V

D. 0.01 V

Answer: B



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14. The weber m^{-2} is equal to :

A. tesla

B. henry

C. watt

D. dyne

Answer: A



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15. The force which is experienced by a moving charged particle in the magnetic field is called :

A. magnetic force

B. electric force

C. Lorentz force

D. none of these

Answer: C



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16. The magnetic susceptibility is negative for :

A. paramagnetic material

B. diamagnetic material

C. both of them

D. none of them

Answer: B



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17. Magnetic susceptibility of ferromagnetic substance is _____ .



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