Saitechinfo NEET JEE Academy

43, Haridoss Main Rd, CH-99. Ph:9444929163

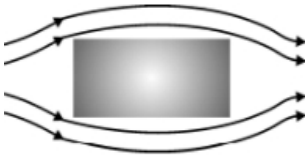
MAGNETISM AND MATTER

Class 12 - Physics

1. Which of the following has its permeability less than that of free space? **[1]**

   a) Copper
   b) Nickel
   c) Copper chloride
   d) Aluminium

2. Which of the following cannot modify an external magnetic field as shown in the figure? **[1]**



   a) Silicon
   b) Sodium Chloride
   c) Copper
   d) Nickel

3. The major contribution of magnetism in substances is due to **[1]**

   a) hidden magnets.
   b) spin motion of electrons
   c) orbital motion of electrons
   d) equally due to orbital and spin motions of electrons

4. At a point on the right bisector of a magnetic dipole, the magnetic: **[1]**

   a) field varies as r^3
   b) potential is zero at all points on the right bisector
   c) field is perpendicular to the axis of dipole
   d) potential varies as $\frac{1}{r^2}$

5. A closely wound solenoid of 800 turns and area of cross section $2.5 \times 10^{-4} \mathrm{m}^2$ carries a current of 3.0 A. What is its associated magnetic moment? **[1]**

   a) 0.4 J/T
   b) 0.8 J/T
   c) 0.6 J/T
   d) 0.5 J/T

6. Does the magnetization of a paramagnetic salt depend on temperature? Give a reason for your answer. **[1]**
7. How many neutral points on a horizontal board are there when a magnet is held vertically on the board? **[1]**
8. Why is diamagnetism independent of temperature? **[1]**
9. What is the torque experienced by a magnetic dipole moment m placed with its axis at angle θ with a uniform magnetic field B? **[1]**
10. How does the magnetic permeability μ_r differ for dia, para and ferromagnetic materials? **[1]**
11. **Assertion:** Paramagnetism is explained by Domain theory. **[1]**

    Reason: Susceptibility of a diamagnetic substance is independent of temperature.

    a) Assertion and reason both are correct
    b) Assertion and reason both are correct

statements and reason is correct explanation for assertion.

b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

c) Assertion is correct statement but reason is wrong statement.

d) Assertion is wrong statement but reason is correct statement.

12. **Assertion (A):** Basic difference between an electric line and magnetic line of force is that former is discontinuous and the latter is continuous or endless. **[1]**

Reason (R): No electric lines of forces exist inside a charged body but magnetic lines do exist inside a magnet.

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

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

13. **Assertion (A):** The basic difference between magnetic lines of force and electric lines of force is electric lines of force are discontinuous and magnetic lines of force are continuous. **[1]**

Reason (R): Magnetic lines of force exist in a magnet but no electric lines of force exist in a charged body.

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

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

14. **Assertion (A):** The poles of a bar magnet cannot be separated. **[1]**

Reason (R): Magnetic monopoles do not exist.

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

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

15. **Assertion:** Copper is a paramagnetic substance. **[1]**

Reason: Paramagnetic substance when placed in a magnetic field are feebly magnetised in a direction opposite to that of the magnetising field.

a) Assertion and reason both are correct statements and reason is correct explanation for assertion.

b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

c) Assertion is correct statement but reason is wrong statement.

d) If both assertion and reason are false.

16. **State True or False:** **[5]**

(a) For ferromagnetic substances, susceptibility is positive. **[1]**

(b) Diamagnetism is explained in terms of electromagnetic induction. **[1]**

(c) A bar magnet can attract an iron nail from a distance. **[1]**

(d) The magnetic lines of force inside a bar magnet are from south-pole to north-pole of the magnet. **[1]**

(e) A bar magnet is placed inside a non-uniform magnetic field. It experiences a force and a torque. **[1]**

17. **Fill in the blanks:** **[5]**

(a) Torque is _____ when the magnet lies perpendicular to the direction of the magnetic field. **[1]**

(b) In the hysteresis cycle, the value of H needed to make the intensity of magnetisation zero is called _____ force. **[1]**

(c) The SI unit of pole strength is _____. **[1]**

(d) Above Curie's temperature, ferromagnetic substances become _____. **[1]**

(e) The magnetic force required to demagnetize the material is _____. **[1]**

18. **Read the text carefully and answer the questions:** **[5]**

The field of a hollow wire with a constant current is homogeneous. Curves in the graph shown give, as functions of radius distance r, the magnitude B of the magnetic field inside and outside four long wires a, b, c and d, carrying currents that are uniformly distributed across the cross-sections of the wires. Overlapping portions of the plots are indicated by double labels.

(a) Which wire has the greatest magnitude of the magnetic field on the surface?

a) c
b) b
c) a
d) d

(b) The current density in a wire a is

a) less than in wire c
b) not comparable to that of in wire c due to lack of information
c) equal to that in wire c
d) greater than in wire c

(c) Which wire has the greatest radius?

a) a
b) c
c) b
d) d

(d) A direct current I flows along the length of an infinitely long straight thin walled pipe, then the magnetic field is

a) zero only along the axis of the pipe
b) uniform throughout the pipe but not zero
c) maximum at the centre and minimum at the edges
d) zero at any point inside the pipe

(e) In a coaxial, straight cable, the central conductor and the outer conductor carry equal currents in opposite direction. The magnetic field is zero

a) outside the cable
b) inside the inner conductor
c) in between the two conductor
d) inside the outer conductor