CHAPTER-5
Magnetism and Matter
ASSIGNMENT-1

MCQ

Q1. When freely suspended, a magnet comes to rest in the direction

(a) North- South (b) East –West (c) South – East (d) None of the above

Q2. Magnetic lines of force always form

(a) Closed loops (b) open loops (c) both a and b (d) None of the above

Q3. The SI unit of magnetic field strength is

(a) Tesla (b) Weber (c) Tesla meter (d) Tesla meter /ampere

Q4. The SI unit of magnetic pole strength is

(a) ampere/metre^2 (b) ampere –meter (c) ampere-meter^2 (d) ampere^2 /meter

Q5. The SI unit of magnetic dipole moment is

(a) ampere –meter^2 (b) ampere –meter (c) ampere-meter^2 (d) ampere^2 /meter

Q6. Magnetic dipole moment is

(a) Scalar (b) vector (c) none

Q7. The torque acting on a magnet with magnetic dipole moment M at an angle θ with the magnetic field B is

(a) $\tau = MB\cos\theta$ (b) $\tau = MB \sin\theta$ (c) $\tau = MB \tan\theta$ (d) None

Q8. Magnetic lines of force

(a) Emanate from N- pole and enter into S- pole

(b) Emanate from S- pole and enter into N- pole

(c) Emanate from S pole to infinity

(d) Emanate from N pole to infinity

Q9. The meniscus of a liquid contained in one of the limbs of a narrow U-tube is placed between the pole-pieces of an electromagnet with meniscus in a line width the field. When the electromagnet is switched on, the liquid is seen to rise in the limb. This indicates that the liquids is

(a) Ferromagnetic (b) paramagnetic (c) Diamagnetic (d) non-magnetic

Q10. For a paramagnetic substance, the magnetic susceptibility is directly proportional to

(a) T (b) T^2 (c) T^0 (d) T^{-1}

Q11. The domain formation is a necessary feature of

(a) Diamagnetism (b) Paramagnetism (c) ferromagnetism (d) All of these

Q12.If a magnetic substance is kept in a magnetic field, then which of the following substances is thrown out

(a) Diamagnetism (b) Paramagnetism (c) ferromagnetism (d) All of these

Q13.Above Curie's temperature ferromagnetic substances behaves like (CBSE 2020)

(a) paramagnetic (b) diamagnetic (c) superconductor (d) no change

Q14.A permanent magnet attracts

(a) all substances (b) only ferromagnetic substances

(c) some substances and repels others (d) ferromagnetic substances and repels all others

Q15.Susceptibility is positive for

(a) paramagnetic substances (b) diamagnetic substances

(c) non- magnetic substances (d) all of the above

1 MARK QUESTIONS

Q16. What is the SI unit of magnetic dipole moment?

Q17. Can two magnetic field lines intersect?

Q18. What is the direction of magnetic dipole moment?

Q19. What is the torque acting on a bar magnet of magnetic moment M in a uniform magnetic field B?

Q20. What is the SI unit of magnetic flux density?

Q21. Are the magnetic moment of a bar magnet and its equivalent solenoid, having the same magnetic field equal?

Q22. Why do magnetic lines of force form continuous closed loops?

Q23. What is magnetic susceptibility?

Q24. What is permeability of the material?

Q25(A). Which of the following substances are diamagnetic?

Bi, Al, Na, Cu, Ca and Ni

(A) The susceptibility of a magnetic material is 1.9×10^{-5}. Name the type of magnetic materials it represents.

2 MARKS QUESTIONS

Q26. (a) Define magnetic field strength. (b) Give its SI unit.

Q27. Define magnetic dipole moment. Is it scalar or vector?

Q28. Give four properties of magnetic field lines.

Q29. Define intensity of magnetization of a magnetic material.

Q30. What are permanent magnets? Give examples.

Q31. Write three points of differences between diamagnetic paramagnetic and ferromagnetic-material.

3 MARK QUESTIONS

Q32. (a) What is the name given to the curves, the tangent to which at any point gives the direction of magnetic field at that point?

(b)Can two such curves intersect each other? Justify your answer.

5 MARK QUESTIONS

Q33. (a) Derive an expression for magnetic field intensity due to a magnetic dipole at a point on its axial line.

(b) A magnetised needle of magnetic moment $4.8X10^{-2}JT^{-1}$ is placed at 30° with the direction of uniform magnetic field of $3 X 10^{-2}$ T. Calculate the torque acting on the needle.

Q34. Explain the following –

(a) Why are the field lines repelled when a diamagnetic material is placed in an external uniform magnetic field?

(b) Draw the magnetic field lines for a current carrying solenoid, when a rod made of – (i) Copper (ii) Aluminium (iii) Iron are inserted within the solenoid.

Assertion and Reason Type Questions

Select the correct answer to these questions from the codes (a), (b), (c) and (d) are as given below

(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 and R is also false.

Q35**.Assertion:** Difference between an electric line and magnetic line of force is that electric linesof force are discontinuous and the magnetic field lines are continuous.

Reason: Electric lines of forces do not exist inside a charged conductor but magnetic lines existinside a magnet.

Q36**.Assertion:** A current carrying solenoid behaves like a bar magnet.

Reason: The circular loop in which the direction of current is clockwise behaves like the SouthPole and the one having anticlockwise current behaves like the North Pole.

Q37**.Assertion:** Permanent magnets retain their ferromagnetic property for a long period of time.

Reason: Steel is a diamagnetic material.

Q38**. Assertion:** When a bar magnet is hung freely it points toward geographical poles.

Reason: Magnetic field lines do not intersect.

Q39. **Assertion:** A diamagnetic specimen would move towards the weaker region of the field.

Reason: A diamagnetic specimen is repelled by a magnet.

Q40.**Assertion:** Motion of electron around a positively charged nucleus is different from the of aplanet around the sun.

Reason: The force acting in both the cases is same in nature.

Q41.**Assertion:** Two parallel conducting wires carrying currents in same direction, come close toeach other.

Reason: Parallel currents attract and anti-parallel currents repel.

Q42.**Assertion:** A galvanometer cannot as such be used as an ammeter to measure the currentacross a given section of the circuit.

Reason: For this it must be connected in series with the circuit.

Q43.**Assertion:** Magnetic lines of force form continuous closed loops whereas electric lines offorce do not.

Reason: Magnetic poles always occur in pairs as North Pole and South Pole.

Q44. **Assertion:** An electron moving along the direction of magnetic field experiences no force.

Reason: The force on electron moving along the direction of magnetic field is $F = qVB \sin 0° = 0$