CHAPTER-5
Magnetism and Matter
ASSIGNMENT-2

Q1. Torque acting on a coil is maximum when the coil is placed

(a) Parallel to the magnetic field

(b) at an angle of 30° to the magnetic field

(c) at any position in a uniform magnetic field

(d) Perpendicular to the magnetic field

Q2. A long current carrying solenoid produces a magnetic field B along its axis. If the current is halved and number of turns/cm is doubled, the magnetic field becomes

(a) B/2 (b) B (c) 8B (d) 2B

Q3. The magnetic field due to a bar magnet at an equatorial point is B, its magnetic field at an axial point at the same distance is

(a) 2B (b) B/2 (c) 4B (d) B

Q 4. Current do not flow between two charged particles when connected if they have same

(a) Capacitance (b) potential (c) charge (d) none of these

Q5. Which of the following is responsible for the earth's magnetic field?

(a) Convective currents in earth's core

(b) Divertive current in earth's core.

(c) Rotational motion of earth.

(d) Translational motion of earth.

Q6. Magnetic field can be produced by

(a) a stationary charge (b) a moving charge (c) a changing electric field (d) Both b and c

Q7. Which of the following statements is true about magnetic field intensity?

(a). Magnetic field intensity is the number of lines of force crossing per unit volume.

(b). Magnetic field intensity is the number of lines of force crossing per unit area.

(c). Magnetic field intensity is the magnetic induction force acting on a unit magnetic pole.

(d). Magnetic field intensity is the magnetic moment per unit volume.

Q8. 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 with 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

Q9.In a permanent magnet at room temperature

(a) Magnetic moment of each molecule is zero

(b) The individual molecules have non-zero magnetic moment which are all perfectly aligned.

(c) Domains are partially aligned.

(d) Domains are all perfectly aligned

Q10.Ferromagnetic Material used in transformer must have

(a) Low Permeability & High Hysteresis Loss

(b) High Permeability & Low Hysteresis Loss

(c) High Permeability & High Hysteresis Loss

(d) Low Permeability & Low Hysteresis Loss

Q11.If the magnetising field on a ferromagnetic material is increased, if permeability is

(a) Decreased (b) Increased (c) unaffected (d)May be decreased or increased

Q12.Electromagnets are made of Soft Iron because Soft Iron has

(a) Small Susceptibility & Small Retentivity

(b) Large Susceptibility & Small Retentivity

(c) Large Permeability & Large Retentivity

(d) Small Permeability & Large Retentivity.

1 MARK QUESTIONS

Q13.How does the (i) pole strength ii) Magnetic moment of each part of a bar magnet change if it is cut into two equal pieces transverse to length?

Q14. A magnetic field interacts with a moving charge and not with a stationary charge. Why?

3.The susceptibility of a magnetic materials is -4.2×10^{-6}. Name the type of magnetic material it represents. (CBSE 2010)

Q15.The susceptibility of a magnetic material is 1.9×10^{-5}. Identify the types of magnetic material. (CBSE 2011)

Q16.The susceptibility of a magnetic material is -2.6×10^{-5}. Identify the types of magnetic material.

2 MARKS QUESTIONS

Q17. When is the torque acting on a dipole (a) Maximum (b) Minimum

Q18. Derive an expression for torque acting on a magnetic dipole placed in a uniform magnetic field.

Q19.Why is the core of an electromagnet made of ferromagnetic materials?

Q20.In what way is the behaviour of a diamagnetic material different from that of paramagnetic when kept in an external magnetic field.

Q21.Explain Curie's law for a paramagnetic substance.

3-MARKS QUESTIONS

Q22.A short bar magnet of magnetic moment $0.9JT^{-1}$ is placed with its axis at 30° to a uniform magnetic field. It experiences a torque of 0.063J. Calculate (i) the magnitude of the magnetic field (ii) in which orientation the bar magnet will be in stable equilibrium? (CBSE2012)

Q23. (a)Define the term magnetic susceptibility and write its relation in terms of relative magnetic permeability. (b)Two magnetic materials A and B have relative magnetic permeabilities of 0.96 and 500. Identify the magnetic materials A and B.

5- MARKS QUESTIONS

Q24. A short bar magnet of is placed with its axis at 30° to a uniform magnetic field of 0.16T. It experiences a torque 0.032J (a) Calculate the magnitude of the magnetic moment of the magnet. (b) In which orientation the magnet will be in stable equilibrium with the magnetic field? (c) Find the PE in stable equilibrium.

Assertion and Reason Type Questions

Assertion-Reason

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.

Q25.**Assertion** The poles of magnet cannot be separated by breaking into two pieces.

Reason The magnetic dipole moment will be reduced to half when broken into two equal pieces. Q26.**Assertion** When a bar magnet is kept in an external uniform magnetic field, it starts oscillating.

Reason A restoring torque acts on the dipole when kept in the magnetic field.

Q27.**Assertion** Two parallel wires carrying currents in the opposite direction, attract each other.

Reason Parallel currents repel and antiparallel currents attract. Q28. **Assertion** Gauss's theorem is not applicable in magnetism.**Reason** Magnetic monopoles do not exist.

Q29.**Assertion** Magnetic field produced by a current carrying solenoid is independent of its lengthand cross-sectional area.

Reason There is a uniform magnetic field inside the solenoid.

Q30. **Assertion** If a charged particle is projected in a region, where B is perpendicular to velocityof projection, then the net force acting on the particle is independent of its mass.

Reason The particle is performing rectilinear motion.

Q31.**Assertion** When a charged particle moves in a region of magnetic field such that its velocityis at some acute angle with the direction of field, its trajectory is a helix.

Reason Perpendicular component of velocity causes a rotating centripetal force and the parallelcomponent of velocity does not produce any force.

Q32. **Assertion** For a current carrying wire loop of N turns, placed in a region of a uniformmagnetic field B, the torque acting on it is given by m x B.

Reason Whenever the magnetic moment m is perpendicular to B, then torque on the loop will bezero.

Q33.**Assertion** The current sensitivity of a galvanometer is the deflection of current per unitcurrent passing through the coil.

Reason The galvanometer can be used as a detector to check if a current is flowing in the circuit.

Q34. **Assertion** Magnetic field lines always form closed loops.

Reason Moving charges or currents produce a magnetic field.