Magnetic Effects of Electric Current

Assertion & Reason Type Questions

Directions: Each of the following questions consists of two statements, one is Assertion (A) and the other is Reason (R). Give answer:

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

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

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q1. Assertion (A): Magnetic field lines do not intersect each other.

Reason (R): Magnetic field lines are imaginary lines, the tangent to which at any point gives the direction of the field at that point.

(CBSE 2023)

Answer : (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

Q2. Assertion (A): A compass needle is placed near a current carrying wire. The deflection of the compass needle decreases when the magnitude of the current in the wire is increases.

Reason (R): The strength of a magnetic field at a point near the conductor increases on increasing the current.

(CBSE SQP 2023-24)

Answer : (d) Assertion (A) is false but Reason (R) is true.

Q3. Assertion (A): On freely suspending a current-carrying solenoid, it comes to rest in Geographical N-S direction.

Reason (R): One end of current-carrying straight solenoid behaves as a North pole and the other end as a South pole, just like a bar magnet.

(CBSE SQP 2022-23)

Answer : (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

Q4. Assertion (A): A solenoid tends to expand, when a current passes through it.

Reason (R): Two straight parallel metallic wires carrying current in same direction repel each other.

Answer : (d) Solenoid tends to contract as the turns of the solenoid attract each other when current flows through them in the same direction.

Q5. Assertion (A): A current carrying straight conductor experiences a force when placed perpendicular to the direction of magnetic field.

Reason (R): The net charge on a current carrying conductor is always zero.

(CBSE 2023)

Answer : (b) Both Assertion (A) and Reason (R) are true but Reason (R) is snot the correct explanation of Assertion (A).

Q6. Assertion (A): In Fleming's left-hand rule, the direction of magnetic field, force and current are mutually perpendicular.

Reason (R): Fleming's left-hand rule is applied to measure the induced current.

Answer : (c) Assertion (A) is true but Reason (R) is false.

Q7. Assertion (A): A fuse in a circuit prevents damage to the appliances and the circuit due to overloading.

Reason (R): Overloading occurs when the live wire and the neutral wire come into direct contact.

Answer : (b) Both Assertion (A) and Reason (R) are true but Reason (R) is snot the correct explanation of Assertion (A).

Q8. Assertion (A) : On changing the direction of flow of current through a straight conductor, the direction of a magnetic field around the conductor is reversed.

Reason (R) : The direction of magnetic field around a conductor can be given in accordance with left hand thumb rule.

Answer : (c)

Q9. Assertion (A) : The magnitude of the magnetic field at a point on the axis of a current carrying solenoid is inversely proportional to the current flowing through the solenoid.

Reason (R) : The magnitude of the magnetic field at a point on the axis of a current carrying solenoid is directly proportional to the number of turns per unit length of a solenoid.

Answer : (d)

Q10. Assertion (A) : A compass needle is placed near a current carrying wire. The deflection of the compass needle decreases when the magnitude of an electric current in the wire is increased.

Reason (R) : Strength of a magnetic field at a point near the conductor increases on increasing the current.

Answer : (d)

Q11. Assertion (A) : A compass needle is placed near a current carrying wire. The deflection of the compass needle decreases when the compass needle is displaced away from the wire.

Reason (R) : Strength of a magnetic field decreases as one moves away from a current carrying conductor.

Answer : (a)

Q12. Assertion (A) : The strength of the magnetic field produced at the centre of a current carrying circular coil increases on increasing the current flowing through the coil.

Reason (R) : Magnetic field strength is inversely proportional to the current flowing in the coil.

Answer : (c)

Q13. Assertion (A) : The strength of the magnetic field produced at the centre of a current carrying circular coil increases on increasing the radius of the circular coil.

Reason (R) : Magnetic field strength is inversely proportional to the radius of the circular coil.

Answer : (d)

Q14. Assertion (A) : The strength of the magnetic field produced at the centre of a current carrying circular coil increases on increasing the number of turns of the circular coil.

Reason (R) : Magnetic field strength is directly proportional to the number of turns of the circular coil.

Answer : (a)

Q15. Assertion (A) : On freely suspending a current-carrying solenoid, it comes to rest in N-S direction just like a bar magnet.

Reason (R) : One end of current carrying straight solenoid behaves as a North pole and the other end as a South pole.

Answer : (a)

Q16. Assertion (A) : Alternating Current is used in household supply.

Reason (R) : AC electric power can be transmitted over long distances without much loss of energy.

Answer : (a)

Q17. Assertion (A) : The strength of the magnetic field at the centre of a circular coil of a wire depends on the radius of the coil

Reason (R) : The strength of the magnetic field at the centre of a circular coil of a wire depends on the number of turns of the wire in the coil.

Answer : (b)

Q18. Assertion (A) : A current carrying wire deflects a magnetic needle placed near it.

Reason (R) : A magnetic field exists around a current carrying wire.

Answer : (a)

Q19. Assertion (A) : Strength of an electromagnet can be increased by increasing the number of turns per unit length in solenoid coil.

Reason (R) : Strength of an electromagnet can be increased by increasing the current flowing through the solenoid.

Answer : (c)