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Magnetic Effects Of Electric Current T2

10th Standard

Science

8 x 1 = 8

1) For a current in a long straight solenoid N- and S- poles are created at the two ends. Among the following statements, the incorrect statement is

- (a) The field lines inside the solenoid are in the form of straight lines which indicates that the magnetic field is the same at all points inside the solenoid
- (b) The strong magnetic field produced inside the solenoid can be used to magnetise a piece of magnetic material like soft iron, when placed inside the coil.
- (c) The pattern of the magnetic field associated with the solenoid is different from the pattern of the magnetic field around a bar magnet.
- (d) The N- and S- Poles exchange position when the direction of current through the solenoid is reversed

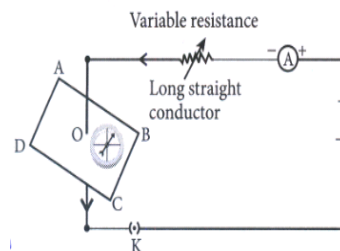
2) Choose the incorrect statement

- (a) Fleming's right-hand rule is a simple rule to know the direction of induced current.
- (b) The right-hand thumb rule is used to find the direction of magnetic fields due to current carrying conductors.
- (c) The difference between the direct and alternating currents is that the direct current always flows in one direction, whereas the alternating current reverses its direction periodically.
- (d) In India, the AC changes direction after every $1/50$ second.

3) To convert an AC generator into DC generator

- (a) Split-ring type commutator must be used (b) Slip rings and brushes must be used
- (c) A stronger magnetic field has to be used (d) A rectangular wire has to be used.

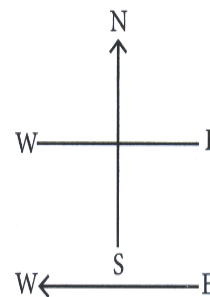
4) If the key in the arrangement (below figure) is taken out (the circuit is made open) and magnetic field lines are



drawn over the horizontal plane ABCD, the lines are

- (a) Concentric circles (b) Elliptical in shape (c) Straight lines parallel to each other
- (d) Concentric circles near the point O but of elliptical shapes as we go away from it.

5) A constant current flows in a horizontal wire in the plane of the paper from east to west as shown in the figure. The



direction of the magnetic field at a point will be North to South

- (a) Directly above the wire (b) directly below the wire
- (c) At a point located in the plane of the paper, on the north side of the wire
- (d) At a point located in the plane of the paper, on the south side of the wire.

6) An instrument which can detect the presence of electric current in a circuit is

- (a) galvanometer (b) motor (c) generator (d) none of the above

7) No force acts on a current carrying conductor when it is placed

- (a) perpendicular to the magnetic field (b) parallel to the magnetic field (c) far away from the magnetic field
- (d) inside a magnetic field.

8) In all the electrical appliances, the switches are put in the

- (a) live wire (b) earth wire (c) neutral wire (d) none of the above

7 x 1 = 7

9) **Assertion:** Magnetic field interacts with a moving charge and not with a stationary charge.

Reason: A moving charge produces a magnetic field

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

10) **Assertion:** The magnetic field intensity at the centre of a circular coil carrying current changes, if the current through the coil is doubled.

Reason: The magnetic field intensity is dependent on current in conductor.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

11) **Assertion:** For a point on the axis of a circular coil carrying current, magnetic field is maximum at the centre of the coil.

Reason: Magnetic field is proportional to the distance of point from the circular coil.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

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

Reason: Two straight parallel metallic wires carrying current in same direction attract each other.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

13) **Assertion:** No net force acts on a rectangular coil carrying a steady current when suspended freely in a uniform magnetic field.

Reason: Forces acting on each pair of the opposite sides of the coil are equal and opposite.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true

14) **Assertion:** In a conductor, free electrons keep on moving but no magnetic force acts on a conductor in a magnetic field.

Reason: Force on free electron due to magnetic field always acts perpendicular to its direction of motion.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true

15) **Assertion:** The magnetic field produced by a current carrying solenoid is independent of its length and cross sectional area.

Reason: The magnetic field inside the solenoid is uniform.

Codes

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R are true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true

7 x 5 = 35

16) Draw a labelled diagram of an electric motor. Explain its principle and working. What is the function of a split ring in an electric motor?

- 17) (a) What is meant by a magnetic field?
(b) How is the direction of magnetic field at a point determined?
(c) Describe an activity to demonstrate the direction of the magnetic field generated around a current carrying conductor.
(d) What is the direction of magnetic field at the centre of a current carrying circular loop?
- 18) (a) What is an electromagnet?
(b) List any of its two uses.
(c) Draw a labelled diagram to show how an electromagnet is made.
(d) What is the purpose of the soft iron core used in making an electromagnet?
- 19) Describe an activity to draw a magnetic field line outside a bar magnet from one pole to another pole.
- 20) Draw a diagram to show the magnetic field lines around a bar magnet. List any two properties of magnetic field lines.
- 21) (a) Explain why there are two separate circuits one for high power rating appliances and other for low power rating appliances.
(b) A domestic circuit has SA fuse. How many bulbs of rating 100 W, 220 V can be safely used in this circuit? Justify your answer.
- 22) (a) Describe activity with labelled diagram to show that a current carrying conductor experience a force in a magnetic field.
(b) State the rule to determine the direction of force