

Practice Challenge - Subjective

Subject: Phy

Topic : Magnetic effects of electric
current - Exam Prep 1

Class: X

Time: 00:20 hrs

1. List the properties of magnetic field lines.

The properties of magnetic field lines are:

- They form closed loops.
- They never intersect each other.
- The magnetic field lines are crowded near the pole where the field is strong and spread apart from each other where the field is weak.
- They flow from the south pole to the north pole within a magnet and north pole to south pole in outside.

2. Why don't two magnetic field lines intersect each other?

Two magnetic field lines do not intersect each other because if there was point of intersection, the compass needle would point towards 2 directions which is not possible.

3. State Right hand thumb rule.

Right hand thumb rule states that, "If you imagine holding a current carrying wire in your right-hand with your thumb pointing towards the direction of electric current flow then the direction in which your fingers curl, gives the direction of lines of force of the magnetic field".

4. Why does a compass needle get deflected when brought near a bar magnet?

The needle of a compass is a small magnet. That's why when a compass needle is brought near a bar magnet, its magnetic field lines interact with that of the bar magnet. Hence, a compass needle gets deflected.

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5. In which direction will a freely suspended bar magnet get aligned? Why?

A freely suspended bar magnet will get aligned in north-south direction. The Earth has its own magnetic field. It is the property of magnet that unlike poles are attracted towards each other. The north pole of bar magnet is attracted towards magnetic south pole of Earth. Hence, freely suspended magnet aligns itself in north-south direction.

6. *The magnetic field associated with a current carrying straight conductor is in anticlockwise direction. If the conductor was held along east - west direction what will be the direction of current through it ? Also state the rule which is used to find the direction of current in this case*

The direction of the flow of current can be found out by Maxwell's Right Hand Thumb Rule. The direction in which the fingers of the right hand curl the thumb would point in the direction of the Current.

Now it is given that the magnetic field is in the anti clockwise direction. If we look at the conductor from the right and apply the Thumb rule, the direction of current would be towards the East. However, if you look at the field from the left and apply this rule, the direction of current would be towards the west

7. How is the magnetic field due to a straight current carrying wire affected if current in the wire is (a) decreased, (b) reversed?

(a) On decreasing current, the magnetic field becomes weaker.

(b) The direction of the magnetic field gets reversed on reversing the current.

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8. Draw magnetic field lines around a bar magnet.

Magnetic field lines of a bar magnet emerge from the north pole and terminate at the south pole. Inside the magnet, the field lines emerge from the south pole and terminate at the north pole, as shown in the given figure.

