

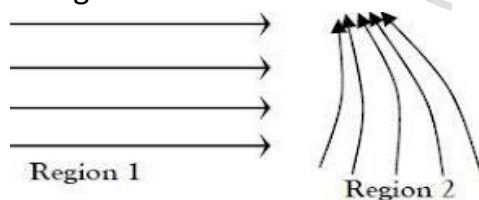
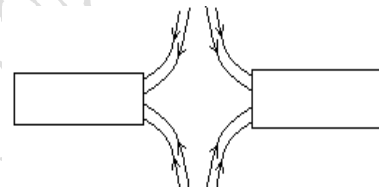
**Sample Paper – 2014**  
**Class – X**  
**Subject – Science**

**Magnetic Effects of Electric Current**

**1mark questions**

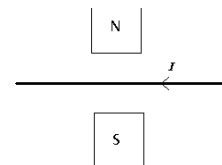
1. Define magnetic fields lines.
2. When is the force experienced by a current-carrying conductor placed in a magnetic field largest?
3. What is the role of slip rings in an AC generator?
4. A uniform magnetic is applied west to east and a straight current carrying vertical conductor is placed in it. In which direction would the conductor be deflected?
5. If the current in a wire is flowing in the vertically downward direction and a magnetic field is applied from west to east, what is the direction of force on the wire?
6. When do we apply Flemings (i)Left hand (ii)Right hand rule.
7. How much force is exerted by a magnetic field on a stationary charge?
8. Name device which is used to save appliances from damage due to short circuiting.
9. State advantages of the earth wire of earth connection in domestic electric appliances?
10. A positive charge is moving vertically upwards, when it enters a region of magnetic field directed toward north, what is the direction of force on the charge?
11. Name two safety measures commonly used in electric circuits and appliances.
12. How can it be shown that a magnetic field exists around a wire through which an electric current is passing?
13. Draw the magnetic field due to current through a circular loop?
14. What is the effect of placing an iron core in a solenoid?

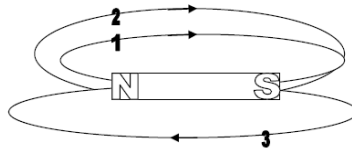
15. What is the effect of increasing the number of turns on the magnetic field produced due to a circular coil?
16. What is the effect of increasing the number of turns on magnetic field produced due to circular coil?
17. In the straight wire A, current is flowing in the vertically downward direction whereas in the wire B the current is flowing in the vertically upward direction. What is the direction of magnetic field: (a) in wire A? (b) in wire B?
18. Meena draws magnetic field lines of field close to the axis of a current carrying circular loop. As she moves away from the centre of the circular loop she observes that the lines keep on diverging. How will you explain her observation.
19. Draw the magnetic lines of force of a bar magnet. Magnetic field lines of two magnets are shown as follows. Name the poles of magnets facing each other.
20. Magnetic fields in two different regions described by magnetic field lines as shown below. What conclusion one can draw about the magnetic fields in region 1 and 2?



**2mark questions**

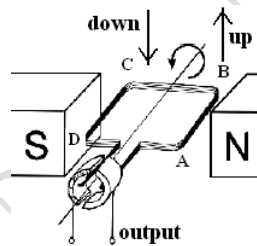
21. A wire is placed between N and S poles of a magnet as shown in the figure. If current is allowed to flow in the wire as shown, in which direction does the wire, tend to move?
22. A student draws three magnetic field lines 1,2 and 3 of a bar magnet with the help of a compass needle as shown in figure. What is wrong in figure? Draw the correct figure showing the magnetic field lines of a bar magnet.





23. Imagine you are sitting in a chamber with your back to one wall. An electron beam, moving horizontally from the front wall towards the back wall, is deflected by a strong magnetic field to your left side. What is the direction of the magnetic field? State the rule used.
24. Why does a compass needle get deflected when brought near a magnet?
25. State Fleming's left hand rule.
26. A wire, stretched horizontally, carries an electric current from East to West direction, in a magnetic field directed vertically downwards. What is the direction of deflecting force on the wire? State the rule used.
27. State and explain how right hand thumb rule indicates magnetic field.
28. Write two differences between direct current and alternating current.
29. Two circular A and B are placed closed to each other. If the current in the coil. A is changed, will some current be induced in the coil B? Give reason.
30. Draw a diagram to show a magnetic field around a straight conductor wire.
31. Explain the term electromagnetic induction with the help of a diagram.
32. A circuit has a fuse of 5A. What is the maximum number of 100 W (220V) bulbs that can be safely used in the circuit?
33. Why does a compass needle get deflected when brought near a bar magnet?
34. Why don't two magnetic lines of force intersect each other?
35. Explain different ways to induce current in a coil.
36. What is the function of an earth wire? Why is it necessary to earth metallic appliances?
37. Explain why the direction of induced current in the coil of an AC generator changes after every half revolution of the coil.
38. Why does a current – carrying conductor experience a force in a magnetic field?
39. Why do we use power supply of two different current ratings at our homes?

40. What is an electric fuse? Which material is selected for fuse wire?
41. In what way can the magnitude of the induced current be increased?
42. Give two differences between electric motor and generator.
43. A domestic lighting circuit has a fuse of 5A. If the mains supply is at 240V, calculate the maximum number of 40 W tube-lights that can be safely used in this circuit.
44. What do you mean by *short circuit*? How does this differ from an *open circuit*?
45. List two factors affecting the magnetic field due a straight current carrying wire.
46. In the figure given below the armature is rotating in a magnetic field. What will be the direction of induced current in the armature ABCD? State the rule used.



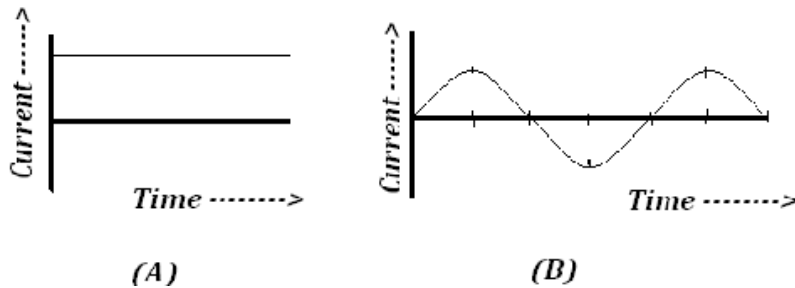
### 3mark questions

1. Write down three precautions that should be taken to avoid the over loading of domestic electric circuits.
2. A coil of insulated copper wire is connected to a galvanometer. What will happen if a bar magnet is (i) pushed into the coil (ii) withdrawn from inside the coil (iii) held stationary inside the coil?
3. How does a solenoid behave like a magnet? Can you determine the north and south poles of a current-carrying with the help of a bar magnet? Explain.
4. List the properties of magnetic lines of force.
5. Write precautions to be taken to avoid the overloading of domestic electric circuits?
6. What do you mean by (a) short circuit and (b) overloading? What are the safety precautions taken to avoid these problems in domestic electric circuits?

7. Draw the pattern of field lines due to a bar magnet. Mention any two properties of the magnetic field lines.
8. Give three advantages of electromagnet over a permanent magnet?
9. Give three points of differences between an electromagnet and a permanent magnet.
10. Consider a circular loop of wire lying in the plane of the table. Let the current pass through the loop clockwise. Apply the right hand rule to find out the direction of the magnetic field inside and outside the loop.

**5mark questions**

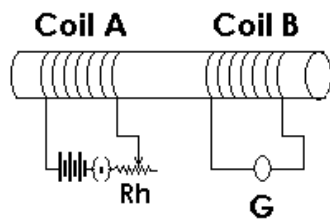
11. What is the function of an earth wire? Why is it necessary to earth the metallic bodies of electrical appliances? What is the usual colour of the insulation of  
(i) Live wire (ii) neutral wire and (iii) earth wire? (5 marks)
12. (a) What is meant by a magnetic field?  
How is the direction of magnetic field at a point determined?  
Describe an activity to demonstrate the direction of the magnetic field generated around a current carrying conductor.  
(b) What is the direction of magnetic field at the centre of a current-carrying circular loop? (5 marks)
13. a) Write two precautions to be taken to avoid the overloading of domestic electric circuits?  
b) Draw the domestic electric circuit diagram consisting of energy meter, main fuse, distribution board, power plug and bulb. (5 marks)
14. Explain the principle, construction and working of an AC generator, showing the output. What is the function of brushes? (5 marks)
15. 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? (5marks)
16. a) How can a magnetic field be produced without using a magnet?  
b) What is an electromagnet? Write two ways by which the strength of an electromagnet may be increased.  
c) Why is it necessary to earth the electric appliances with metallic cover?
17. a) You are given the following current-time graphs from two different sources. Identify the nature of electric sources.



b) An electron beam is moving horizontally from south to north in the earth's magnetic field directed downwards. In which direction will the beam get deflected? State the rule used to determine the direction of deflection.

c) In the following set-up, the deflection will occur in the galvanometer in which of the following cases? Give suitable reason for answer.

- Key connected to coil A is 'OFF'.
- The position of the knob of rheostat connected to the coil A is changed.
- The position of the knob of rheostat connected to the coil A is kept fixed.



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