

## CLASS X Questions Bank Magnetic effects of electric current

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### One mark Questions:

1. How can you show that the magnetic field produced by a given electric current in the wire decreases as the distance from the wire decreases?
2. What is the advantage of the third wire of earth connection in domestic appliances?
3. What constitutes the field of a magnet?
4. What is short-circuiting in an electric supply?
5. What will be the frequency of an alternating current if its direction changes after every 0.01s?
6. An alternating electric current has a frequency of 50 Hz. How many times does it change its direction in 1s?
7. How is the strength of the magnetic field at a point near a wire related to the strength of the electric current flowing in the wire?
8. How can it be shown that a magnetic field exists around a wire through which a direct current is passing?
9. On what effect of an electric current does an electromagnet work?
10. What is the direction of magnetic field at the centre of a circular coil carrying current in anticlockwise direction?

### Two Mark Questions

1. With the help of a neat-diagram, describe how you can generate induced current in a circuit.
2. What is meant by the term "Magnetic field Lines"? List two properties of magnetic field lines.
3. Write the rule which determines the direction of magnetic field developed around a straight conductor when current is passed through the conductor.
4. State the rule to determine the direction of magnetic field produced around a current carrying conductor.
5. On which factors does the force experienced by a current carrying conductor placed in a uniform magnetic field depend?
6. State Fleming's right-hand Rule.
7. Why is series arrangement not used for domestic circuits?
8. Differentiate between electric force and magnetic forces.
9. How does AC differ from DC? What are the advantages and disadvantages of AC over DC?
10. Draw the magnetic field due to a current carrying circular coil. State the clock rule to find the polarities of the faces of the coil.

### Three Mark Questions

1. Draw the pattern of field lines due to a solenoid carrying electric current. Mark the north and the south poles in the diagram.
2. Draw the pattern of lines of force due to a magnetic field through and around a current carrying loop of wire. How would the strength of the magnetic field produced at the centre of the circular loop be affected if (i) the strength of the current passing through this loop is doubled? (ii) the radius of the loop is reduced to half of the original radius?
3. Draw the pattern lines of force due to a magnetic field associated with a current carrying conductor. State how the magnetic field produced changes (i) with an increase in current in the conductor and (ii) the distance from the conductor.
4. Draw the pattern of field lines due to a bar magnet. Mention any two properties of the magnetic field lines.

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5. How does the strength of the magnetic field at the centre of a circular coil of wire depend on: (i) the radius of the coil? (ii) the number of turns of the wire? (iii) the strength of the current flowing in the coil?
6. The flow of a current in a circular loop of a wire creates a magnetic field at its centre. How can existence of the field be detected? State the rule which helps to predict the direction of this magnetic field.
7. What are the factors on which the strength of magnetic field produced by current-carrying solenoid depends?
8. A coil of copper wire is connected to a galvanometer. What would happen if a bar magnet is: (i) pushed into the coil with north pole entering first (ii) pulled out of the coil (iii) held stationary inside the coil?
9. Explain what is short-circuiting and overloading in an electric supply.
10. What are magnetic field lines? How is the direction of a magnetic field at a point determined? Mention two important properties of the magnetic field lines.

### Five Mark Questions:

1. (a) Suggest an activity to show the pattern of magnetic field lines, when you are provided with a bar magnet, a cardboard piece and iron filings. (b) Draw a rough sketch of the field lines which you will observe.
2. (a) What is an electromagnet? What does it consist of? (b) Name one material in each case used to make a (i) permanent magnet (ii) temporary magnet. (c) Describe an activity to show how can you make an electromagnet in your school lab?
3. State Fleming's left-hand rule. With a labeled diagram, describe the working of an electric motor. What is the function of split-ring Commutator in a motor?
4. State Fleming's right-hand rule. With a labeled diagram, describe the working of an AC electric generator.
5. Draw the lines of force of the magnetic field through and around (a) single loop of wire carrying current, (b) a solenoid carrying electric current.
6. Why is pure iron not used for making permanent magnets? Name one material used for making permanent magnets. Describe how permanent magnets are made electrically. State two examples of electrical appliances made by using permanent magnets.
7. (a) Draw a schematic labeled diagram of a domestic wiring circuit which includes (i) a main fuse (ii) a power meter (iii) one light point (iv) a power plug. (b) Why is it necessary to connect an earth wire to electric appliances having metallic covers?
8. (a) What are magnetic field lines? How is the direction of a magnetic field at a point determined? (b) Draw two field lines around a bar magnet along its length on its two sides and mark the field directions on them by arrow marks. (c) List any three properties of magnetic field lines.
9. What is an electric motor? With the help of a diagram, describe the working of an electric motor.
10. What are magnetic field lines? Write their characteristics. Draw the magnetic field lines due to a current flowing in a circular coil.
11. Explain the principle, construction and working of an electric motor.
12. Explain with labeled diagram, the principle, construction and working of an electric generator.
13. (a) . What is an electromagnet ?  
(b). List any of its two uses.

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- (c). Draw a labeled diagram to show how an electromagnet is made.
- (d). What is the purpose of the soft iron core used in making an electromagnet ?

### Numerical:

1. The mains power supply of a house is through a 5-A fuse. How many 100-W bulbs can be used in this house at the correct voltage?
2. A wire 10 cm long and carrying a current of 1.5 A is held in a uniform magnetic field in which  $B=10^{-3}$  T. Calculate the force on the wire if it is held perpendicular to the lines of the magnetic field.
3. A current of 10 A flows in a circular coil of 1000 turns and radius 0.1 m. Find the magnitude of the magnetic field at the centre of the coil.
4. At what distance from a straight conductor carrying a current of 2.8 A, will the magnetic induction be  $2.8 \times 10^{-5}$  T?
5. Find the strength of the current which will produce a magnetic field of  $10^{-4}$  T at the centre of a coil of mean radius 0.10 m. The coil comprises 20 turns.
6. A 0.4 m wire, stretched horizontally, carries an electric current of 15 A from East to West, in a magnetic field whose magnetic field intensity is 0.1 N/Am, directed vertically downwards. What is (a) the magnitude of the magnetic deflecting force on the wire, and (b) its direction?