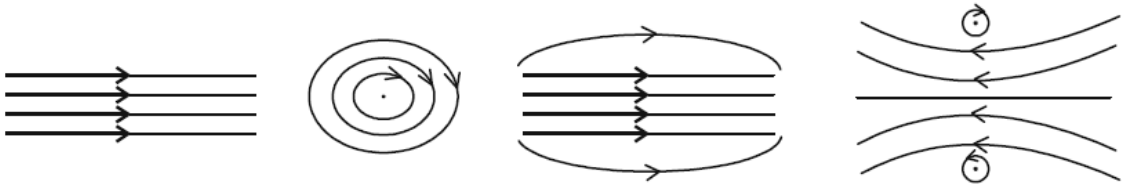
Year 2024

Short Answer Type Question [1 Marks]

1) The pattern of the magnetic field produced inside a current carrying solenoid is :**[(31/1/1); (31/1/2); (31/3/3)]**



(a) (b) (c) (d)

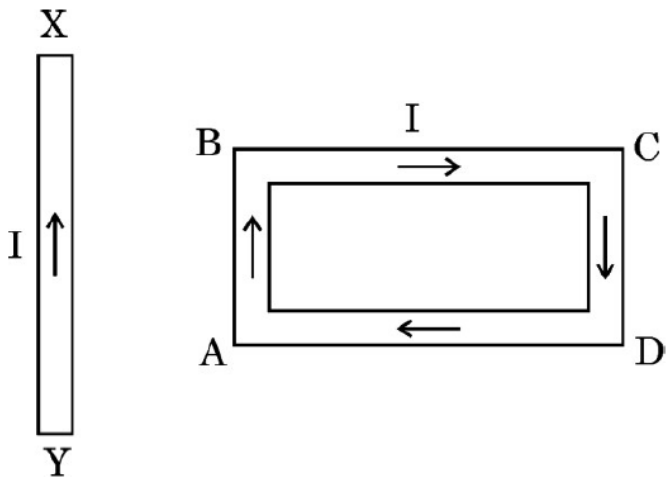
2) Strength of magnetic field produced by a current carrying solenoid DOESNOT depend upon : **[(31/2/1); (31/2/2)]**

(a) number of turns in the solenoid
(b) direction of the current flowing through it
(c) radius of solenoid
(d) material of core of the solenoid

3) Study the following statements : **[(31/2/3)]**

(a)A fuse in a circuit prevents damage to the circuit due to overloading.
(b) Total resistance in a circuit increases due to overloading.
(c) During short circuiting the current in the circuit abruptly increases.
(d) In order that each appliance has same current, they are connected inparallel to each other.
The correct statements are
(a) a and b (b) b and d (c) a and c (d) a, c and d

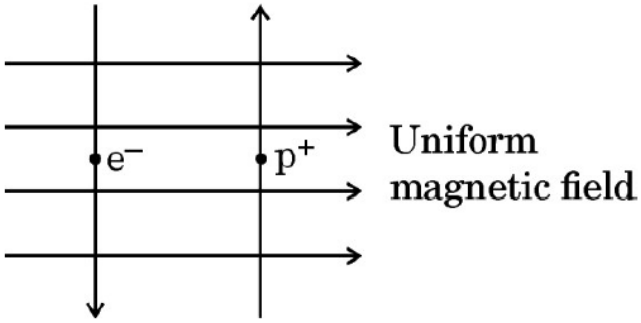
4) A rectangular loop ABCD carrying a current I is situated near a straight conductor XY, such that the conductor is parallel to the side AB of the loop and is in the plane of the loop. If a steady current I is established in the conductor as shown, the conductor XY will **[(31/4/1); (31/4/2); (31/4/3)]**



(a) remain stationary.
(b) move towards the side AB of the loop.
(c) move away from the side AB of the loop.
(d) rotate about its axis.

5) The current carrying device which produces a magnetic field similar to that of a bar magnet is : **[(31/5/1); (31/5/2); (31/5/3)]**
(a) A straight conductor (b) A circular loop (c) A solenoid (d) A circular coil

6)



[(31/5/1); (31/5/2); (31/5/3)]
A uniform magnetic field exists in the plane of paper as shown in the diagram. In this field, an electron (e^-) and a positron (p+) enter as shown. The electron and positron experience forces :
(a) both pointing into the plane of the paper.
(b) both pointing out of the plane of the paper.
(c) pointing into the plane of the paper and out of the plane of the paper respectively.
(d) pointing out of the plane of the paper and into the plane of the paper respectively.

Assertion and Reasoning [1 Mark]

These consist of two statements —Assertion (A) and Reason(R). Answer these questions selecting the appropriate option given below:
(a) Both Assertion (A) and Reason(R) are true and Reason(R) is the correct explanation of the Assertion (A).
(b)Both Assertion (A) and Reason(R) are true, but Reason(R) is not the correct explanation of the Assertion (A).
(c)Assertion(A) is true, but Reason(R) is false.
(d)Assertion (A) is false, but Reason(R) is true.

1) Assertion (A) : The deflection of a compass needle placed near a current carrying wire decreases when the magnitude of an electric current in the wire is increased.
Reason (R) : Strength of the magnetic field at a point due to a current carrying conductor increases on increasing the current in the conductor. **[(31/2/1); (31/2/2); (31/2/3)]**

2) Assertion (A) : Magnetic field lines never intersect each other.
Reason (R) : If they intersect, then at the point of intersection, the compass needle would point towards two directions, which is not possible. **[(31/4/1); (31/4/2); (31/4/3)]**

Very Short Answer Type Question [2 Marks]

1) (i) Two magnetic field lines do not intersect each other. Why ?
(ii) How is a uniform magnetic field in a given region represented ?
Draw a diagram in support of your answer. **[(31/1/1); (31/1/2); (31/3/3)]**

2) Draw the pattern of the magnetic field lines due to a straight currentcarrying conductor indicating the direction of current in the conductor and the direction of the corresponding magnetic field lines. **[(31/1/3)]**

3) Draw a labelled diagram to show the pattern of magnetic field lines produced due to a current carrying straight conductor. Mark on it the direction of current in the conductor and the direction of magnetic field lines. **[(31/3/1); (31/3/2); (31/3/3)]**

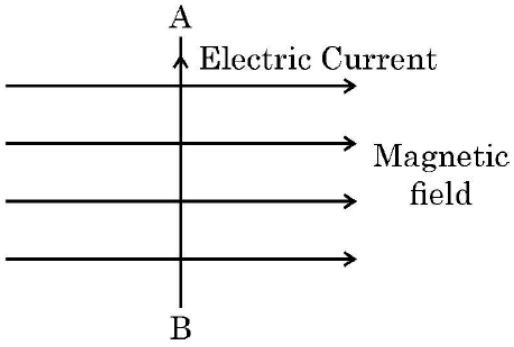
4) Name the device used to magnetise a piece of magnetic material. Draw a labelled diagram to show the arrangement used for the magnetisation of a cylinder made of soft iron. **[(31/3/1); (31/3/2); (31/3/3)]**

Short Answer Type Questions [3 Marks]

1) Name and state the rule to determine the direction of a:
(i)magnetic field produced around a current carrying straight conductor.
(ii) force experienced by a current carrying straight conductor placed ina magnetic field which is perpendicular to it. **[(31/1/1); (31/1/2); (31/1/3)]**

2) Draw a diagram to show the pattern of magnetic field lines on a horizontal sheet of paper due to a straight conductor passing through its centre and carrying current vertically upwards. Mark on it (i) the direction of current in the conductor and (ii) the corresponding magnetic field lines. State right hand thumb rule and check whether the directions marked by you are in accordance with this rule or not. **[(31/2/1)]**

3) (a) State Fleming's left hand rule. Apply this rule to determine the direction of force experienced by a straight current carrying conductor AB placed in a uniform magnetic field as shown.



(b) What will happen to an electron which enters in the same field in the same direction in which the current is flowing in the conductor AB ? Give reason to justify your answer. **[(31/2/2)]**

4) Define the term solenoid. Draw the pattern of magnetic field lines around a current carrying solenoid. State how this magnetic field can be used to magnetise a piece of magnetic material, like soft iron. **[(31/2/3)]**

5) List three advantages of parallel circuits in domestic wiring. **[(31/3/2)]**

6) A student fixes a sheet of white paper on a drawing board. He places a bar magnet in the centre of it. He sprinkles some iron filings uniformly around the bar magnet. Then he taps the drawing board gently and observes that the iron filings arrange themselves in a particular pattern.
(a) Why do iron filings arrange in a particular pattern ?
(b) What does the crowding of iron filings at the ends of the magnet indicate ?
(c) What do the lines, along which the iron filings align, represent ?
(d) If the student places a cardboard horizontally in a current carrying solenoid and repeats the above activity, in what pattern would the iron filings arrange ? State the conclusion drawn about the magnetic field based on the observed pattern of the lines. **[(31/4/1); (31/4/3)]**

7) (a) How is a solenoid prepared ? Differentiate between a circular coil and a solenoid.
(b) Draw the pattern of the magnetic field lines inside a current carrying solenoid. What does this pattern indicate ? **[(31/4/2)]**

8) (a) What happens when a bundle of wires of soft iron is placed inside the coil of a solenoid carrying a steady current ? Name the device obtained. Why is it called so ?
(b) Draw the magnetic field lines inside a current carrying solenoid. What does this pattern of magnetic field lines indicate ? **[(31/5/1)]**

9) "Earth wire is a safety measure in domestic electric circuits." Justify this statement explaining its role in case of accidental leakage of electric appliances. **[(31/5/2)]**

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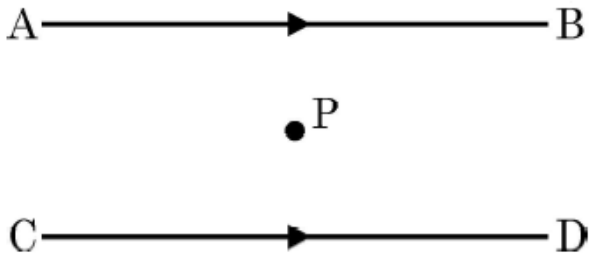
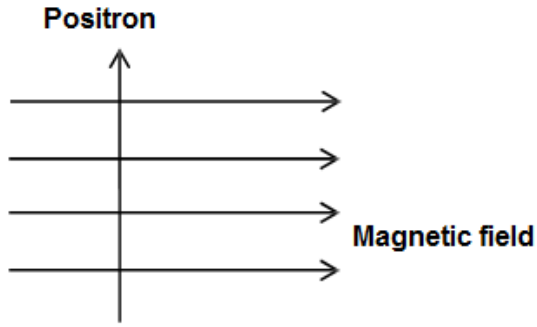
Short Answer Type Question [1 Marks]

1. The resultant magnetic field at point 'P' situated mid way between two parallel wires (placed horizontally) each carrying a steady current I is **[(31/1/1); (31/1/2); (31/1/3)]**



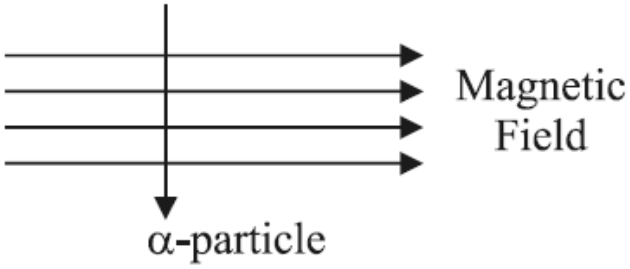
(a) in the same direction as the current in the wires.
(b) in the vertically upward direction.
(c) zero
(d) in the vertically downward direction.

2. Apositronentersauniformmagneticfieldatrightanglestoitasshown.Thedirectionofforceexperiencedbythepositronwillbe: **[(31/2/1); (31/1/3)]**



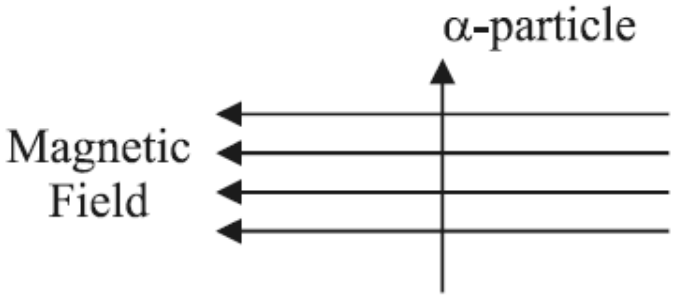
(a) to the right (b) to the left (c) into the page (d) out of the page

3. An alpha particle enters a uniform magnetic field as shown. The direction of force experienced by the alpha particle is : **[(31/4/1); (31/4/2)]**



(a) towards right (b) towards left (c) into the page (d) out of the page

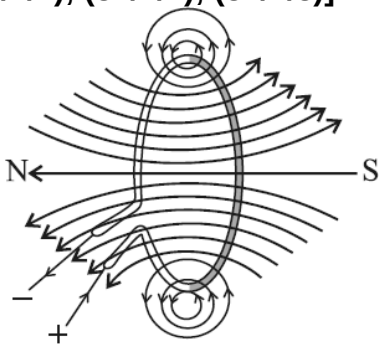
4. An alpha particle enters a uniform magnetic field as shown. The directionof force experienced by the alpha particle is : **[(31/4/1); (31/4/2)]**



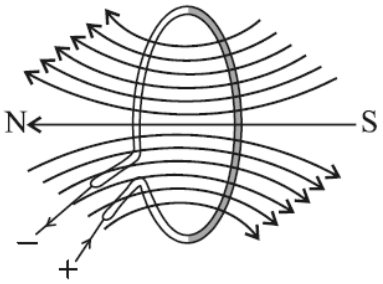
(a) towards right (b) towards left (c) into the page (d) out of the page

5. The correct pattern of magnetic field lines of the field produced by acurrent carrying circular loop is :**[(31/4/1); (31/4/2); (31/4/3)]**

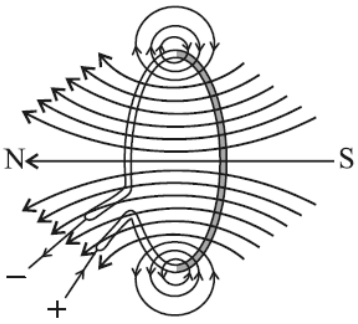
(a)



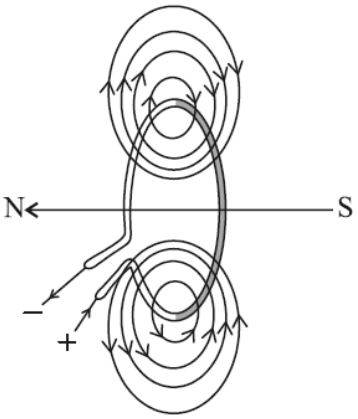
(b)



(c)



(d)

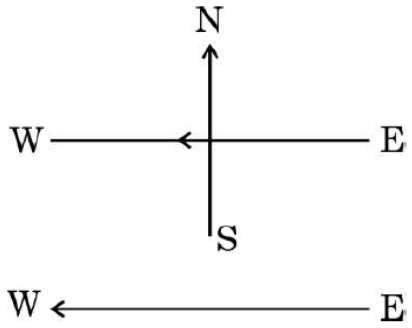


6. For a current in a long straight solenoid, N and S poles are created at the two ends. Among the following statements, the incorrect statement is : **[(31/5/1); (31/5/2); (31/5/3)]**
(a) The magnetic field lines inside the solenoid are in the form of straight lines, which indicates that the magnetic field is uniform at all points inside the solenoid.
(b) The strong magnetic field produced inside the solenoid can magnetize the soft iron placed inside it.
(c) The pattern of the magnetic field associated with a current carrying solenoid is different from the pattern of the magnetic field around a bar magnet.
(d) The N and S poles exchange positions when the direction of current through the solenoid is reversed.

7. 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 will be north to south at a point :**[(31/5/2)]**
(a) directly above the wire.
(b) directly below the wire.

(c) located in the plane of the paper on the north side of the wire.
(d) located in the plane of the paper on the south side of the wire.

8. 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 will be north to south at a point: **[(31/5/1); (31/5/2); (31/5/3)]**



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

9. The magnetic field inside a long straight current carrying solenoid : **[(31/6/1); (31/6/2); (31/6/3)]**
(a) is zero.
(b) decreases as we move towards its end.
(c) increases as we move towards its end.
(d) is same at all points.

Assertion and Reasoning [1 Mark]

These consist of two statements —Assertion(A) and Reason(R). Answer these questions selecting the appropriate option given below:

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

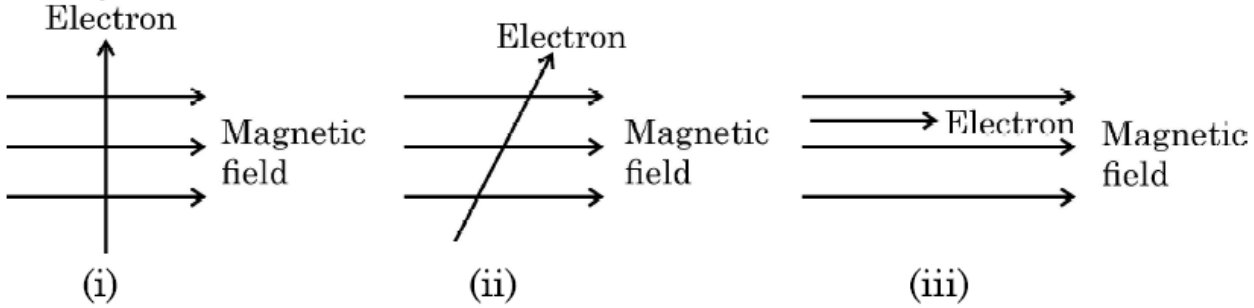
1. Assertion(A):The strength of the magnetic field produced at the centre of a current carrying circular coil increases on increasing the number of turns in it.
Reason(R):The current in each circular turn has the same direction and the magnetic field due to each turn then just adds up. **[(31/1/1); (31/1/2); (31/1/3)]**
2. 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. **[(31/2/1)**
3. Assertion (A) : A current carrying straight conductor experiences a force when placed perpendicular to the direction of magnetic field. **[(31/4/1); (31/4/2); (31/4/3)]**
Reason (R) : The net charge on a current carrying conductor is always zero.
4. Assertion (A): The magnetic field lines around a current carrying straight wire do not intersect each other.
Reason (R): The magnitude of the magnetic field produced at a given point increases as the current through the wire increases. **[(31/5/1);(31/5/2); (31/5/3)]**

Very Short Answer Type Questions [2 Marks]

1. Consider a circular loop of thick copper wire lying horizontally on a table. Let the current pass through the loop anticlockwise. Draw the magnetic field lines to show the direction and the pattern of the magnetic field inside and outside the loop. **[(31/2/2)]**
2. State the rule to determine the direction of a (a) magnetic field produced around a straight conductor carrying current and (b) force experienced by a current carrying straight conductor placed in a magnetic field which is perpendicular to it. **[(31/6/1); (31/6/2)]**
3. Draw magnetic field lines produced around a straight current carrying conductor passing through a cardboard. How will the strength of the magnetic field change when the point where magnetic field is to be determined is moved away from the conductor ? **[(31/6/3)]**

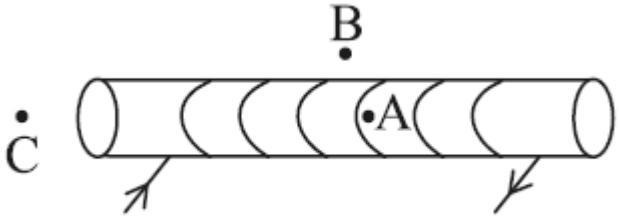
Short Answer Type Question [3 Marks]

1) (i) State the rule used to find the force acting on a current carrying conductor placed in a magnetic field.
(ii) Given below are three diagrams showing entry of an electron in amagnetic field. Identify the case in which the force will be
(1) maximum and (2) minimum respectively. Give reason for your answer. **[(31/1/1); (31/1/2); (31/1/3)]**



2) (i) Draw the pattern of magnetic field lines of **[(31/1/1); (31/1/2); (31/1/3)]**
(1) a current carrying solenoid
(2)a bar magnet
(ii)List two distinguishing features between the two fields.
3) Explain the meaning of over loading of an electrical circuit. List two possible causes due to which overloading may occur in house hold circuits. Write one preventive measure that should be taken to avoid overloading of domestic circuits. **[(31/2/1)]**
4) What is a solenoid ? Draw a diagram to show the pattern of magnetic field around a current carrying solenoid. Name the region of uniform magnetic field.**[(31/2/2)]**
5) (a) List two factors on which the magnitude of magnetic field producedby a current carrying straight conductor depends.
(b) State the rule which determines the direction of magnetic field inthe above case.
(c) Draw the pattern of magnetic field lines produced in this case.**[(31/2/3)]**
6) (i) Why is an alternating current (A.C.) considered to be advantageous over direct current (D.C.) for the long distance transmission of electric power ?
(ii) How is the type of current used in household supply different from the one given by a battery of dry cells ?
(iii) How does an electric fuse prevent the electric circuit and the appliances from a possible damage due to short circuiting or overloading.**[(31/4/1); (31/4/2); (31/4/3)]**

7) For the current carrying solenoid as shown, draw magnetic field lines and give reason to explain that out of the three points A, B and C, at which point the field strength is maximum and at which point it is minimum ? **[(31/4/1); (31/4/2); (31/4/3)]**



8) (a) (i) A straight cylindrical conductor is suspended with its axis perpendicular to the magnetic field of a horse-shoe magnet. The conductor gets displaced towards left when a current is passed through it. What will happen to the displacement of the conductor if the
(1) current through it is increased ?
(2) horse-shoe magnet is replaced by another stronger horse-shoe magnet ?
(3) direction of current through it is reversed ?
(ii) Name and state the rule for determining the direction of force on a current carrying conductor in a magnetic field. **[(31/5/1);(31/5/2); (31/5/3)]**

9) Draw the pattern of the magnetic field produced around a vertical current carrying straight conductor passing through a horizontal cardboard. Mark the direction of current and the magnetic field lines. Name and state the rule which is used to determine the direction of magnetic field associated with a current carrying conductor. **[(31/5/1);(31/5/2); (31/5/3)]**

10) What is a solenoid ? When does a solenoid behave as a magnet ? Draw the pattern of the magnetic field produced inside it showing the directions of the magnetic field lines.**[(31/6/1); (31/6/2); (31/6/3)]**

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Short Answer TypeQuestion [2 Marks]

1. (i) Name and state the rule to determine the direction of force experienced by a current carrying straight conductor placed in a uniform magnetic field which is perpendicular to it.
(ii) An alpha particle while passing through a magnetic field gets projected towards north. In which direction will an electron project when it passes through the same magnetic field?
[(31/1/1); (31/1/2); (31/1/3)]
2. (i) What is a solenoid?
3. (ii) Draw the pattern of magnetic field lines of the magnetic field produced by a solenoid through which a steady current flows. **[(31/1/1); (31/1/2); (31/1/3)]**
4. (a) Name the poles P, Q, R and S of the magnets in following figures

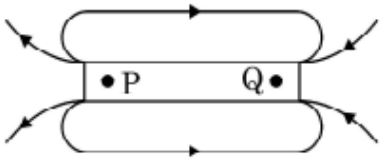


Figure 'a'

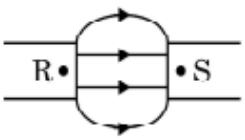
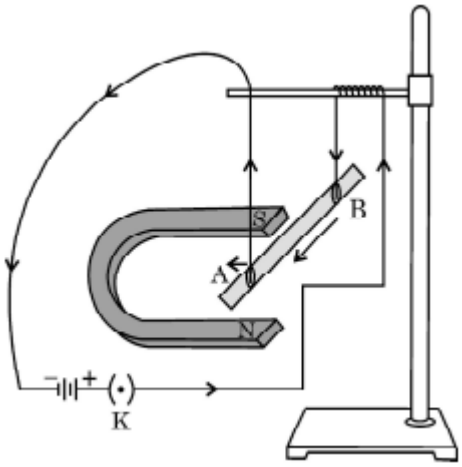


Figure 'b'

(b) State the inference drawn about the direction of magnetic field lines on the basis of these diagrams. **[(31/2/1); (31/2/2); (31/2/3)]**

5. When is the force experienced by a current-carrying straight conductor placed in a uniform magnetic field.
   (i) Maximum
   (ii) Minimum? **[(31/2/1); (31/2/2); (31/2/3)]**
6. As shown in the diagram an aluminium rod 'AB' is suspended horizontally between the two poles of a strong horse shoe magnet in such a way that the axis of rod is horizontal and the direction of the magnetic field is vertically upward. The rod is connected in series with a battery and a key.



Sate giving reason
(i) What is observed when a current is passed through the aluminium rod from end B to end A?
(ii) What change is observed in a situation in which the axis of the rod 'AB' is moved and aligned parallel to the magnetic field and current is passed in the rod in the same direction?

Or

"Magnetic field is a physical quantity that has both direction and magnitude". How can this statement be proved with help of magnetic field line of bar magnet?**[(31/4/1); (31/4/2); (31/4/3)]**

7. What is a magnetic field? How is the direction of a magnetic field at a place determined?**[(31/B/5)]**
8. What is the pattern of the magnetic field lines produced by a current carrying straight conductor? State the rule that determines the direction of the magnetic field in this case.**[(31/B/5)]**

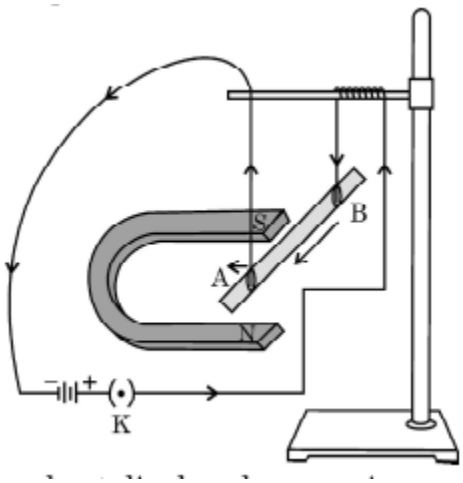
Short Answer Type Question [3 Marks]

1. What is a Solenoid? Draw the pattern of the magnetic field lines around a current carrying solenoid. Mark on the pattern the region where the magnetic field is uniform.**[(31/3/1)]**
2. (a) Draw the pattern of magnetic field lines around a bar magnet. Mark the position of North Pole, South Pole and the places where the magnetic field is strongest.
   (b) Why do the magnetic field lines not intersect each other? **[(31/3/2)]**
3. (a) Draw the pattern of magnetic field lines produced by a current carrying circular loop showing the direction of current in the loop and the direction of the magnetic field lines.
   (b) State the rule which can be applied to know the direction of magnetic field lines in the above case. **[(31/3/3)]**
4. (i) What is a Solenoid? What does the divergence of magnetic field lines near the ends of a current carrying solenoid indicate?

(ii) How is an electromagnet made using a current carrying solenoid? **[(31/B/5)]**

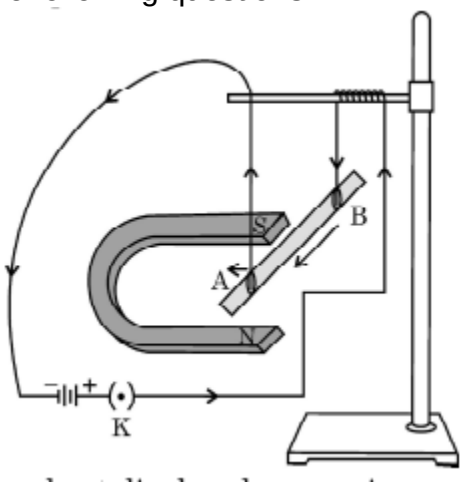
Case-based Question [4 Marks]

1. A student fixes a sheet of white paper on a drawing board using some adhesive materials. She places a bar magnet in the centre of it and sprinkles some iron filings uniformly around the bar magnet using a salt-sprinkler. On tapping the board gently, she observes that the iron filings have arranged themselves in a particular pattern.
   (a) Draw a diagram to show this pattern of iron filings.
   (b) Draw the magnetic field lines of a bar magnet showing the poles of the bar magnet as well as the direction of the magnetic field lines.
   (c) (i) How is the direction of magnetic field at a point determined using the field lines? Why do two magnetic field lines not cross each other?
   OR
   (ii) How are the magnetic field lines of a bar magnet drawn using a small compass needle? Draw one magnetic field line each on both sides of the magnet. **[(31/1/1)]**
2. A student fixes a sheet of white paper on a drawing board using some adhesive materials. She places a bar magnet in the centre of it and sprinkles some iron filings uniformly around the bar magnet using a salt-sprinkler. On tapping the board gently, she observes that the iron filings have arranged themselves in a particular pattern.
   (a) Draw a diagram to show this pattern of iron filings.
   (b) What does this pattern of iron filings demonstrate ?
   (c) (i) How is the direction of magnetic field at a point determined using the field lines? Why do two magnetic field lines not cross each other?
   OR
   (ii) How are the magnetic field lines of a bar magnet drawn using a small compass needle? Draw one magnetic field line each on both sides of the magnet. **[(31/1/2)]**
3. A student fixes a sheet of white paper on a drawing board using some adhesive materials. She places a bar magnet in the centre of it and sprinkles some iron filings uniformly around the bar magnet using a salt-sprinkler. On tapping the board gently, she observes that the iron filings have arranged themselves in a particular pattern.
   (a) Draw a diagram to show this pattern of iron filings.
   (b)What makes iron filings arrange in a definite pattern?
   (c) (i) How is the direction of magnetic field at a point determined using the field lines? Why do two magnetic field lines not cross each other?
   OR
   (ii) How are the magnetic field lines of a bar magnet drawn using a small compass needle? Draw one magnetic field line each on both sides of the magnet. **[(31/1/3)]**
4. A student was asked to perform an experiment to study the force on current carrying conductor in a magnetic field. He took a small aluminium rod AB, a strong horseshoe magnet, some connecting wires, a battery and a switch and connected them as shown. He observed that on passing current, the rod get displaced. On reversing the direction of current, the direction of displacement also gets reversed. On the basis of your understanding of this phenomenon, answer the following questions.



(a) Why does the rod get displaced on passing current through it?
(b) State the rule that determines the direction of force on conductor AB.
(c) (i) If the U shaped magnet is held vertically and the aluminum rod is suspended horizontally with its end B towards due north, then on passing current through the rod from B to A as shown, in which direction will rod be displaced?
(ii) Name any two devices that use current carrying conductors and magnetic field.
Or
Draw the pattern of magnetic field lines produce around a current carrying straight conductor held vertically on horizontal cardboard. Indicate the direction of field lines as well as the direction of current flowing through the conductor. **[(31/2/1)]**

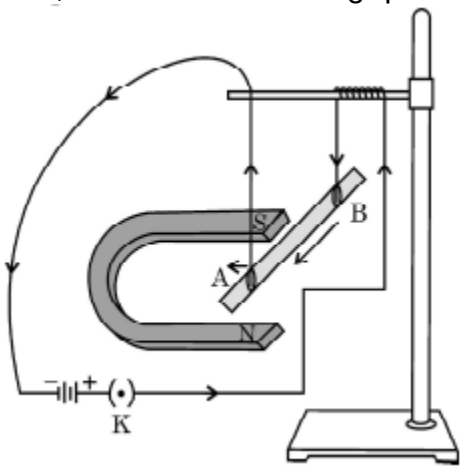
5. A student was asked to perform an experiment to study the force on current carrying conductor in a magnetic field. He took a small aluminium rod AB, a strong horseshoe magnet, some connecting wires, a battery and a switch and connected them as shown. He observed that on passing current, the rod get displaced. On reversing the direction of current, the direction of displacement also gets reversed. On the basis of your understanding of this phenomenon, answer the following questions.



(a) Why does the rod get displaced on passing current through it?
(b) State the rule that determines the direction of force on conductor AB.
(c) (i) In the above experimented setup, when current is passed through the rod, it gets displaced towards the left. What will happen to the displacement if the polarity of the magnet and the direction of current both are reversed?

(ii) Name any two devices that use current carrying conductors and magnetic field.
Or
Draw the pattern of magnetic field lines produce around a current carrying straight conductor held vertically on horizontal cardboard. Indicate the direction of field lines as well as the direction of current flowing through the conductor. **[(31/2/2)]**

6. A student was asked to perform an experiment to study the force on current carrying conductor in a magnetic field. He took a small aluminium rod AB, a strong horseshoe magnet, some connecting wires, a battery and a switch and connected them as shown. He observed that on passing current, the rod get displaced.On reversing the direction of current,the direction of displacement also gets reversed. On the basis of your understanding of this phenomenon,answer The following questions.



(a) State the condition under which the displacement of rod is largest for the same magnitude of current flowing through it.
(b) State the rule that determines the direction of force on conductor AB.
(c) (i) If the U shaped magnet is held vertically and the aluminum rod is suspended horizontally with its end B towards due north, then on passing current through the rod from B to A as shown, in which direction will rod be displaced?
(ii) Name any two devices that use current carrying conductors and magnetic field.
Or
Draw the pattern of magnetic field lines produce around a current carrying straight conductor held vertically on horizontal cardboard. Indicate the direction of field lines as well as the direction of current flowing through the conductor. **[(31/2/3)]**

Year 2020

Short Answer Type Questions [1 Mark]

1) The change in magnetic field lines in a coil is the cause of induced electric current in it. Name the underlying phenomenon. **[(31/1/1); (31/1/2)]**
2) State an important advantage of using alternating current (a.c.) over directcurrent (d.c.).**[(31/1/2)]**
3) Define the term induced electric current. **[(31/4/1); (31/4/2)]**

Short Answer Type Questions [3 Marks]

1) Give reasons for the following :
(i) There is either a convergence or a divergence of magnetic field lines near the ends of a current carrying straight solenoid.

(ii) The current carrying solenoid when suspended freely rests along a particular direction.
(iii) The burnt out fuse should be replaced by another fuse of identical rating**[(31/3/1); (31/3/2); (31/3/3)]**

2) (a) Draw the pattern of magnetic field lines due to a magnetic field through and around a current carrying circular loop.
(b) Name and state the rule to find out the direction of magnetic field inside and around the loop.**[(31/5/3)]**

Long Answer Type Questions [5 Mark]

1) (a) What is an electromagnet? List any two uses.
(b) Draw a labelled diagram to show how an electromagnet is made.
(c) State the purpose of soft iron core used in making an electromagnet.
(d) List two ways of increasing the strength of an electromagnet if the material of the electromagnet is fixed. **[(31/1/1); (31/1/2)]**
2) (a) Explain with help of the pattern of magnetic field lines the distribution of magnetic field due to current carrying a circular loop.
(b) Why is it that the magnetic field of a current carrying coil having n turns, is 'n' times as large as that produced by a single turn(loop)? **[(31/1/3)]**
3) (a) State Fleming's Left-hand rule.
(b) List three characteristic features of the electric current used in our homes.
(c) What is a fuse? Why is it called a safety device?
(d) Why is it necessary to earth metallic electric appliances? **[(31/4/1); (31/4/3)]**
4) (a) State with reasons the mode of connecting all electrical appliances in common domestic electric circuits.
(b) Which two separate circuits are often used in domestic electric circuits and why ?
(c) When does an electric short circuit occur ? How can it be prevented ? **[(31/4/2)]**

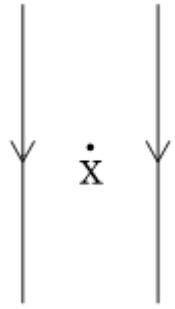
Year 2019

Very Short Answer Type Questions [2 Marks]

1) Draw magnetic field lines around a bar magnet.**[(31/4/1)]**
2) Draw magnetic field lines in and around a current carrying straight solenoid. **[(31/4/2)]**
3) It is established that an electric current through a conductor produces a magnetic field around it. Is there a similar magnetic field produced around a thin beam of moving (i) alpha particles, (ii) neutrons? Justify your answer in each case.**[(31/4/3)]**
4) A compass needle is placed near a current carrying straight conductor. State your observation for the following cases and give reasons for the same in each case :
   a. Magnitude of electric current is increased.
   b. The compass needle is displaced away from the conductor.**[(31/5/1)]**
5) List four properties of magnetic field lines.**[(31/5/2)]**

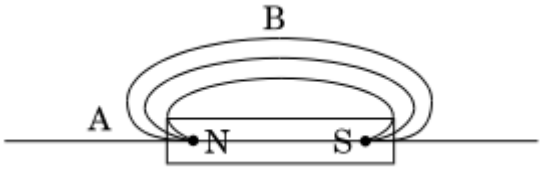
Short Answer Type Questions [3 Marks]

1) The following diagram shows two parallel straight conductors carrying same current. Copy the diagram and draw the pattern of the magnetic field lines around them showing their directions. What is the magnitude of magnetic field at a point 'X' which is equidistant from the conductors? Give justification for your answer.



[(31/4/2)]

2) State right-hand thumb rule to determine the direction of magnetic field around a current carrying conductor. Apply this rule to find the direction of magnetic field inside and outside a circular loop of wire lying in the plane of a table and current is flowing through it clockwise. **[(31/4/3)]**
3) Magnetic field lines are shown in the given diagram. A student makes a statement that the magnetic field at 'A' is stronger than at 'B'. Justify this statement. Also redraw the diagram and mark the direction of magnetic field lines.



[(31/5/3)]

Long Answer Type Questions [5 Marks]

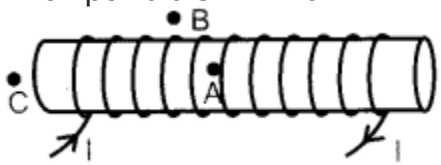
1) What is a solenoid? Draw the pattern of magnetic field lines of
(i) a current carrying solenoid and (ii) a bar magnet. List two distinguishing features between the two fields. **[(31/1/1) ; (31/1/2); (31/1/3)]**
2) (a) Draw magnetic field lines produced around a current carrying straight conductor passing through a cardboard. Name, state and apply the rule to mark the direction of these field lines.
(b) How will the strength of the magnetic field change when the point where magnetic field is to be determined is moved away from the straight wire carrying constant current? Justify your answer. **[(31/2/1)]**
3) Draw the pattern of magnetic field lines produced around a current carrying straight conductor passing perpendicularly through a horizontal cardboard. State and apply right-hand thumb rule to mark the direction of the field lines. How will the strength of the magnetic field change when the point where magnetic field is to be determined is moved away from the straight conductor? Give reason to justify your answer. **[(31/2/2) ; (31/2/3)]**
4) (a) Name and state the rule to determine the direction of force experienced by a current carrying straight conductor placed in a uniform magnetic field which is perpendicular to it.
(b) Draw a labelled diagram of an electric motor.**[(31/3/1); (31/3/2); (31/3/3)]**

Year 2015

Short Answer Type Questions [3 Marks]

1) Describe an activity to show that the magnetic field lines produced when current is passed through the circular coil.
2) What is meant by solenoid? How does a current carrying solenoid behave? Give its main use.

3) For the current carrying solenoid as shown below, draw magnetic field lines and giving reason explain that out of the three points A, B and C at which point the field strength is maximum and at which point it is minimum.



4) With the help of a diagram of experimental setup describe an activity to show that the force acting on a current carrying conductor placed in a magnetic field increases with increase in field strength.
5) What are magnetic field lines? Justify the following statements
(a) Two magnetic field lines never intersect each other.
(b) Magnetic field lines are closed curves.

Long Answer Type Question [5 Marks]

1) (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.

Year 2014

Very Short Answer Type Questions [2 Marks]

1) Why and when does a current carrying conductor kept in a magnetic field experience force? List the factors on which direction of this force depends?
2) How is the strength of magnetic field near a straight current-conductor
(i) related to the strength of current in the conductor?
(ii) is affected by changing the direction of flow of current in the conductor?
3) What is meant by the term 'frequency of an alternating current'? What is its value in India? Why is an alternating current considered to be advantageous over direct current for long range transmission of electric energy?

Short Answer Type Questions [3 Marks]

1) State one main difference between A.C and D.C. Why A.C is preferred over D.C for long range transmission of electric power? Name one source each of D.C and A.C.
2) State the consequences that can lead to a short circuit.
Or
One of the major cause of fire in office building is short circuiting. List three factors which may lead to the short circuit.

Long Answer Type Questions [5 Marks]

1) (a) Describe an activity to demonstrate the pattern of magnetic field lines around a straight conductor carrying current.
(b) State the rule to find the direction of magnetic field associated with a current carrying conductor.
(c) What is the shape of a current carrying conductor whose magnetic field pattern resembles that of a bar-magnet ?
2) (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 5A fuse. How many bulbs of rating 100W, 220V can be safely used in this circuit? Justify your answer.

3) (i) Design an activity with the help of two nails, very thin aluminium strip, a 12 V Battery and a key to illustrate.how electric fuse works.
(ii) Cable of a microwave oven has three wires inside it which have insulation of different colours black, green and red. Mention the significance of the three colours and potential difference between red and black one.

Year 2013

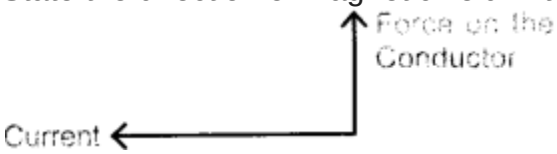
Very Short Answer Type Questions [2 Marks]

1) Explain any two situations that can cause electrical hazards in domestic circuits.

Year 2012

Very Short Answer Type Questions [1 Mark]

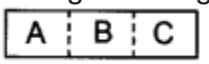
1) Name the type of current:
(a) used in household supply.
(b) given by a cell.
2) State the direction of magnetic field in the following case.



3) A positively charged particle (alpha-particle) projected towards west is deflected towards north by a magnetic field. The direction of magnetic field is
(a) towards north (b) towards east (c) downward (d) upward

Short Answer Type Questions [2 Marks]

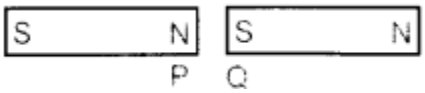
1) The given magnet is divided into three parts A, B, and C.



Name the parts where the strength of the magnetic field is: (i) maximum (ii) minimum.
How will the density of magnetic field lines differ at these parts?

2) A compass needle is placed near a current-carrying wire. State your observation for the following cases, and give reason for the same in each case.
(a) Magnitude of electric current in the wire is increased.
(b) The compass needle is displaced away from the wire.

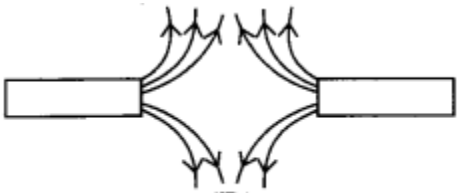
3) (a) Two magnets are lying side by side as shown below.
Draw magnetic field line between poles P and Q.



(b) What does the degree of closeness of magnetic field lines near the poles signify?

4) Magnetic field lines of two magnets are shown in fig. A and fig. B.

(A)



(B)

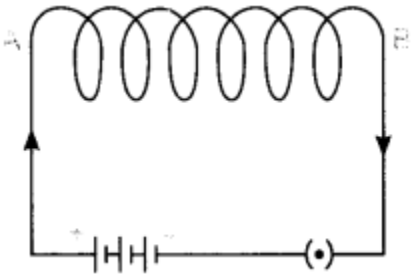
Select the figure that represents the correct pattern of field lines. Give reasons for your answer. Also name the poles of the magnets facing each other.

Short Answer Type Questions [3 Marks]

1) With help of diagram, describe an activity to draw the magnetic field lines around a coil carrying current?
2) What is short circuiting? State one factor/condition that can lead to it. Name a device in the household that acts as a safety measure for it. State the principle of its working.
3) State one main difference between A.C. and D.C. Why is A.C. preferred over D.C. for long range transmission of electric power? Name one source each of D.C. and A.C.

Long Answer Type Questions [5 Marks]

1) (a) Mention the effect of electric current on which the working of an electrical fuse is based.
   (b) Draw a schematic labelled diagram of a domestic circuit which has a provision of a main fuse, meter, one light bulb and a socket.
   (c) Explain the term overloading of an electric circuit.
2) Observe the figure given below and answer the following questions:
   (a) Write the special name given to the coil AB which has many circular turns of insulated copper wire.

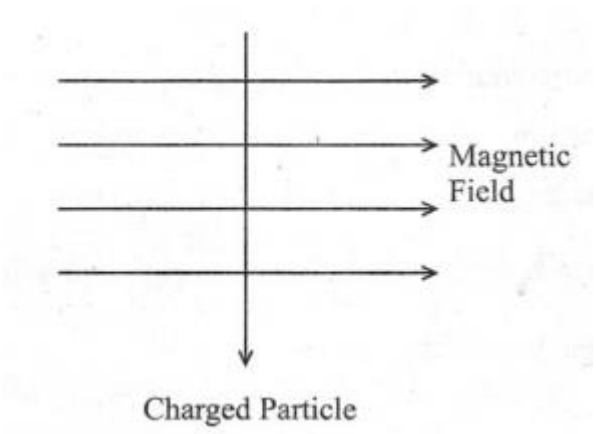


   (b) State the nature of magnetic field inside AB when a current is passed through it.
   (c) Redraw the diagram and sketch the pattern of magnetic field lines through and around AB.
   (d) List two factors on which the strength of the magnetic field produced by AB depends.
   (e) What is the effect of placing an iron core in the coil AB?

Year 2010

Short Answer Type Questions [1 Marks]

1) A charged particle enters at right angles into a uniform magnetic field as shown. What should be the nature of charge on the particle if it begins to move in a direction pointing vertically out of the page due to its interaction with the magnetic field? **[Delhi]**



Very Short Answer Type Questions [2 Marks]

1) What is a solenoid? Draw the pattern of magnetic field lines of a solenoid through which a steady current flows. What does the pattern of field lines inside the solenoid indicate ?**[Delhi]**
2) Insulation cover of which colour is conventionally used for earth wire? Why is an earth wire connected to metallic parts of appliances?
3) Identify the poles of the magnet in the given figure (1) and (2).

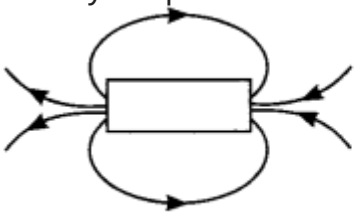


Figure (1)

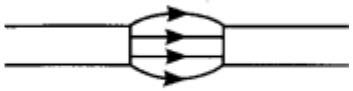


Figure (2)

4) Explain the role of fuse in series with any electrical appliance in an electric circuit. Why should a fuse with defined rating for an electric circuit not be replaced by one with a larger rating?
5) The magnetic field associated with a current-carrying straight conductor is in anticlockwise direction. If the conductor was held along the east-west direction, what will be the direction of current through it? Name and state the rule applied to determine the direction of current.

Short Answer Type Questions [3 Marks]

1) How can a magnetic field be produced without using a magnet? Describe an experiment to show that a magnetic field exerts a force on a current carrying conductor.**[Foreign]**

Year 2009

Very Short Answer Type Questions [1 Marks]

1) When is the force experienced by a current-carrying conductor placed in a magnetic field the largest? **[All India]**
2) State the rule which gives the direction of magnetic field associated with a current-carrying conductor. **[All India]**

Short Answer Type Questions [3 Marks]

1) (a) Draw a schematic labelled diagram of a domestic wiring circuit which includes
   (i) a main fuse
   (ii) a power meter
   (iii) one light point

(iv) a power output socket

(b) In this circuit, on which wire of the circuit is the mains on/offswitch connected ?**[Foreign]**

Long Answer Type Questions [5 Marks]

1) (a) What is a magnetic field ? How can the direction of magnetic field lines at aplaced be determined ?
(b) State the rule for the direction of the magnetic field produced around a current carrying conductor. Draw a sketch of the pattern of field lines due to a current flowing through a straight conductor.**[All India]**
2) (a) What is a solenoid ? Draw a sketch of the pattern of field lines of the magnetic field through and around a current carrying solenoid.
(b) 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. **[All India]**
3) n