Magnetic Effects of Electric Current

10th Standard

Science

Multiple Choice Question 36 x 1 = 36

1) The magnetic field inside a long straight current carrying solenoid

(a) is zero (b) decrease as we move towards its end (c) increases as we move towards its end

(d) is the same at all points.

2) Which of the following property of a proton can change while it moves freely in a magnetic field ?

(a) mass (b) speed (c) velocity (d) momentum

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 south (b) towards east (c) downward (d) upward

4) Which of the following correctly describes the magnetic field near a long straight wire ?

(a) The field consists of straight lines perpendicular to the wire.

(b) The field consists of straight lines Parallel to the wire.

(c) The field consists of radial lines originating from the wire.

(d) The field consists of concentric circles centred on the wire.

5) At the time of short circuit, the current in the circuit

(a) reduces substantially (b) does not change (c) increases heavily (d) vary continuously

6) A rectangular coil of copper wire is rotated in a magnetic field. The direction of the induced current changes once in each

(a) Two revolutions (b) One revolution (c) Half revolution (d) One-fourth revolution

7) The phenomenon of electromagnetic induction is

(a) the process of charging a body.

(b) the process of generating magnetic field due to a current passing through a coil.

(c) producing induced current in a coil due to relative motion between a magnet and the coil.

(d) the process of rotating a coil of an electric motor.

8) The device used for producing electric current is called a

(a) generator (b) galvanometer (c) ammeter (d) motor

9) The essential difference between an AC generator and a DC generator is that

(a) AC generator has an electromagnet while a DC generator has permanent magnet.

(b) DC generator will generate a higher voltage. (c) AC generator will generate a higher voltage

(d) AC generator has slip rings while the DC generator has a commutator.

10) Choose the incorrect statement from the following regarding magnetic lines of field.

(a) The direction of magnetic field at a point is taken to be the direction in which the north pole of a magnetic compass needle points.

(b) Magnetic field lines are closed curves

(c) if magnetic field lines are parallel and equidistant, they represent zero field strength

(d) Relative strength of magnetic field is shown by the degree of closeness of the field lines.

11) 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

12) Commercial electric motors do not use

(a) An electromagnet to rotate the armature

(b) Effectively large number of turns of conducting wire in the current carrying coil

(c) A permanent magnet to rotate the armature (d) A soft iron core on which the coil is wound

13) 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.

14) The strength of magnetic field inside a long current carrying straight solenoid is

(a) More at the ends than at the centre (b) Minimum in the middle (c) Same at all points

(d) Found to increase from one end to the other.

15) To convert an AC generator into DC generator

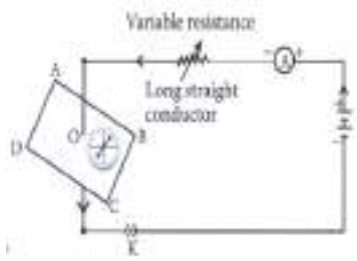
(a) Split-ring type commutator must be used (b) Slip rings and brushes must be used

(c) A stronger magnetic field has to be used (d) A rectangular wire has to be used.

16) The most important safety method used for protecting home appliances from short circuiting or overloading is

(a) Earthing (b) Use of fuse (c) Use of stabilisers (d) Use of electric meter.

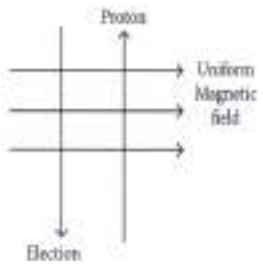
17) If the key in the arrangement (below figure) is taken out (the circuit is made open) and magnetic field lines are drawn over the horizontal plane ABCD, the lines are



(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.

18) A uniform magnetic field exists in the plane of paper pointing from left to right as shown in Figure. In the field an electron and a proton move as shown in the figure. The electron and the proton experience

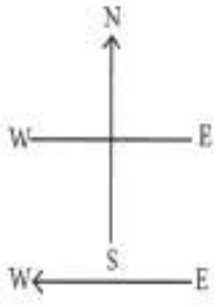


(a) Forces both pointing into the plane of paper (b) Forces both pointing out of the plane of paper

(c) Forces pointing into the plane of paper and out of the plane of paper, respectively.

(d) Force pointing opposite and along the direction of the uniform magnetic field respectively.

19) 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



(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.

20) The core of an electromagnet must be of

(a) soft iron (b) hard iron (c) rusted iron (d) none of the above

21) 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

22) The right-hand thumb rule is stated by

(a) Oersted (b) Maxwell (c) Fleming (d) none of the above

23) 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.

24) The condition necessary for electromagnetic induction is that

(a) there must be a relative motion between the coil of wire and galvanometer.

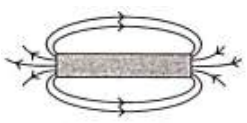
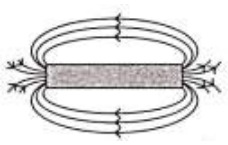
(b) there must be a relative motion between the coil of wire and a magnet.

(c) there must be a relative motion between the galvanometer and a magnet (d) all of the above.

25) 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

26) Which of these magnets has the strongest magnetic field?

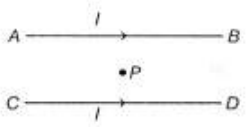
(a)  (b)  (c)  (d) 

27) Which of the following pattern correctly describes the magnetic field around sqpa long straight wire carrying current?

(a) Straight lines perpendicular to the wire (b) Straight lines parallel to the wire

(c) Radial lines originating from the wire (d) Concentric circles centred around the wire

28) The resultant magnetic field at point P situated midway between two parallel wires (placed horizontally) each carrying a steady current I is



(a) in the same direction as the current in the wires (b) in the vertically upward direction (c) Zero

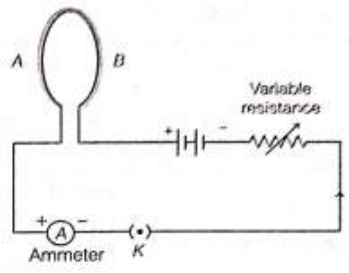
(d) in the vertically downward direction

29) A current flows in a straight wire in the direction of the arrow, shown below.

Choose the correct directions of the magnetic field produced by the current at X and Y

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

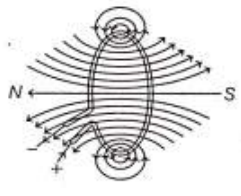
30) A circular loop placed in a plane perpendicular to the plane of paper carries a current when the key is ON. The current as seen from points A and B (in the plane of paper and on the axis of the coll) is anti-clockwise and clockwise, respectively. The magnetic field lines point from B to A. The N-pole of the resultant magnet Is on the face close to

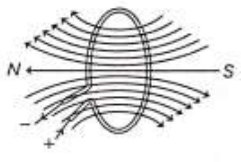


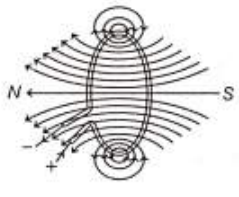
(a) A (b) B (c) A, if the current is small and B, if the current is large

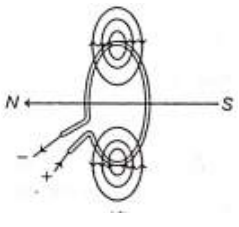
(d) B, if the current is small and A, if the current is large

31) The correct pattern of magnetic field lines of the field produced by a current carrying circular loop is

(a) 

(b) 

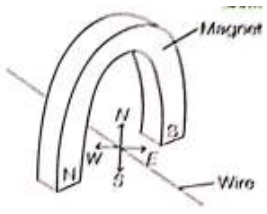
(c) 

(d) 

32) Which of these devices works due to the magnetic effect of electric current?

(a) LED bulb (b) Electric bell (c) Electric heater (d) Mobile charger

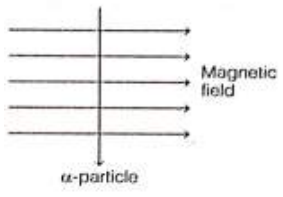
33) A copper wire is held between the poles of a magnet.



The current in the wire can be reversed. The pole of the magnet can also be changed over. In how many of the four directions shown can the force act on the wire?

(a) 1 (b) 2 (c) 3 (d) 4

34) An alpha particle enters a uniform magnetic field as shown. The direction of force experienced by alpha particle is



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

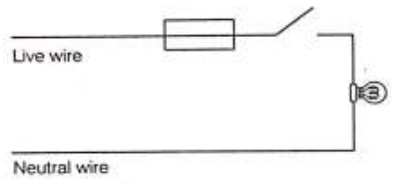
35) The frequency of AC in some countries is 60 Hz.
What does this mean?

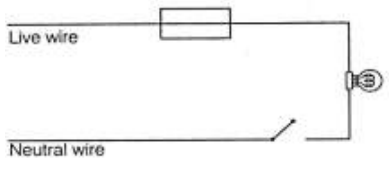
(a) The current changes direction 60 times in a second. (b) The current changes direction 120 times in a second

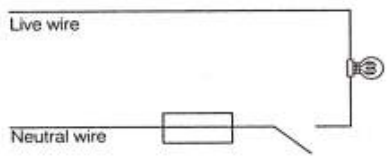
(c) The current changes direction after every 60 seconds

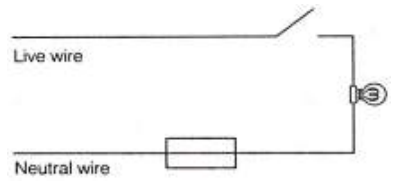
(d) The current changes direction after every 120 seconds.

36) Which circuit shows the correct and safe positions for the fuse and the switch?

(a) 

(b) 

(c) 

(d) 

2 Marks 21 x 2 = 42

37) Why does a compass needle get deflected when brought near a bar magnet?

38) Why don't two magnetic field lines intersect each other?

39) The magnetic field in a given region is uniform. Draw a diagram to represent it.

40) Name two safety measures commonly used in electric circuits and appliances.

41) When is the force experienced by a current carrying conductor placed in a magnetic field largest ?

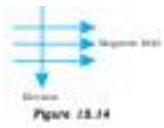
42) When does an electric short circuit occur?

43) What is the function of an earth wire ? Why is its necessary to earth metallic appliances?

44) List two methods of producing magnetic fields.

45) A current through a horizontal power line flows in east to west direction. What is the direction of magnetic field at a point directly below it and at a point directly above it?

46) An electron enters a magnetic field at right angles to it, as shown in Fig. The direction of force acting on the electron will be



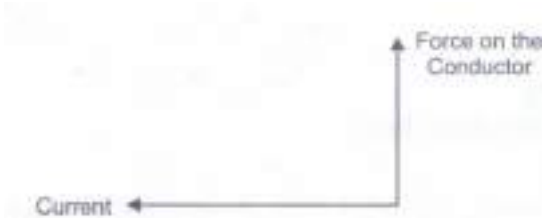
(a) to the right.
(b) to the left.
(c) out of the page.
(d) into the page.

47) What is meant by the term, 'magnetic field'? Why does a compass needle show deflection when brought near a bar magnet?

48) Explain briefly the term overloading

49) Name the type of current:
(a) used in household supply. (b) given by a cell.

50) State the direction of magnetic field in the following case.



51) Give one application of electromagnetic induction

52) Name the physical quantities which are indicated by the direction of thumb and forefinger in the Fleming's right hand rule?

53) How is an electromagnet different from a permanent magnet?

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

55) 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.

56) 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.

57) 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 fleid inside and outside a circular loop of wire lying In the plane of a table and current is flowing through it clockwise.

3 Marks 15 x 3 = 45

58) List the properties of magnetic lines of force.

59) 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.

60) An electric oven of 2kW power rating is operated in a domestic electric circuit (220 v) that has a current rating of 5 A. What result do you expect ? Explain.

61) What precaution should be taken to avoid the overloading of domestic electric circuits?

62) State whether the following statements are true or false.
(a) The field at the centre of a long circular coil carrying current will be parallel straight lines.
(b) A wire with a green insulation is usually the live wire of an electric supply.

63) Imagine that you are sitting in a chamber with your back to one wall. An electron beam, moving horizontally from back wall towards the front wall, is deflected by a strong magnetic field to your right side. What is the direction of magnetic field?

64) State the rule to determine the direction of a
(i) Magnetic field produced around a straight conductor carrying current
(ii) Force experienced by a current carrying straight conductor placed in a magnetic field which is perpendicular to it.
(iii) current induced in a coil due to its rotation in a magnetic field.

65) How do we think the displacement of rod AB will be affected, if
(i) current in rod AB is increased,
(ii) a stronger horse-shoe magnet is used and
(iii) length of the rod AB is increased?

66) Distinguish between an electric motor and generator?

67) Name the materials used to make an electromagnet. Explain how you can make one in the lab.

68) 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.

69) What is an electromagnet? Draw a circuit diagram to show how a soft iron piece can be transformed into an electromagnet.

70) Write one application of each of the following:
(a) Right-hand thumb rule
(b) Fleming's left hand rule
(c) Fleming's right hand rule

71) 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

72) 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.
(i) Magnitude of electric current in the wire is increased.
(ii) The compass needle is displaced away from the wire

Case Study Questions 9 x 4 = 36

73) An insulated copper wire wound on a cylindrical cardboard tube such that its length is greater than its diameter is called a solenoid. When an electric current is passed through the solenoid, it produces a magnetic field around it. The magnetic field produced by a current-carrying solenoid is similar to the magnetic field produced by a bar magnet. The field lines inside the solenoid are in the form of parallel straight lines. The strong magnetic field produced inside a current-carrying solenoid can be used to magnetise a piece of magnetic material like soft iron, when placed inside the solenoid. The strength of magnetic field produced by a current carrying solenoid is directly proportional to the number of turns and strength of current in the solenoid.

(i) The strength of magnetic field inside a long current -carrying straight solenoid is

(a) more at the ends than at the centre

(b) minimum in the middle

(c) same at all points

(d) found to increase from one end to the other.

(ii) The north-south polarities of an electromagnet can be found easily by using

(a) Fleming's right-hand rule **(b) Fleming's left-hand rule**

(c) Clock face rule **(d) Left-hand thumb rule**

(iii) 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.

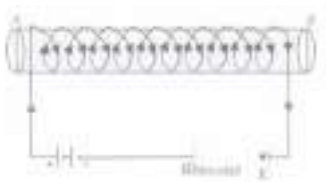
(c) The pattern of the magnetic field associated with the solenoid is different from the pattern of the magnetic field around a bar magnet.

(d) The N- and S-poles exchange position when the direction of current through the solenoid is reversed.

(iv) A long solenoid carrying a current produces a magnetic field B along its axis. If the current is double and the number of turns per cm is halved, then new value of magnetic field is

(a) B **(b) 2B** **(c) 4B** **(d) B/2**

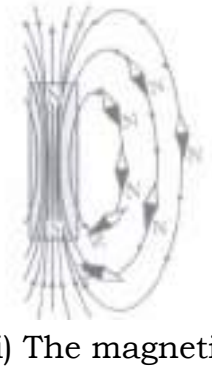
(v) A soft iron bar is enclosed by a coil of insulated copper wire as shown in figure. When the plug of the key is closed, the face B of the iron bar marked as



(a) N-pole **(b) S-pole**

(c) N-pole if current is large **(d) S-pole if current is small**

74) A magnetic field is described by drawing the magnetic field lines. When a small north magnetic pole is placed in the magnetic field created by a magnet, it will experience a force. And if the north pole is free, it will move under the influence of magnetic field. The path traced by a north magnetic pole free to move under the influence of a magnetic field is called a magnetic field line. Since the direction of magnetic field line is the direction of force on a north pole, so the magnetic field lines always begin from the N-pole of a magnet and end on the S-pole of the magnet. Inside the magnet, however the direction of magnetic field lines is from the S-pole of the magnet to the N-pole of the magnet. Thus, the magnetic field lines are closed curves. When a small compass is moved along a magnetic field line, the compass needle always sets itself along the line tangential to it. So, a line drawn from the south pole of the compass needle to its north pole indicates the direction of the magnetic field at that point.



(i) The magnetic field lines

(a) intersect at right angle to one another

(b) intersect at an angle of 45° to each other

(c) do not cross one another

(d) cross at an angle of 60° to one another.

(ii) A strong bar magnet is placed vertically above a horizontal wooden board. The magnetic lines of force will be

(a) only in horizontal plane around the magnet

(b) only in vertical plane around the magnet

(c) in horizontal as well as in vertical planes around the magnet

(d) in all the planes around the magnet.

(iii) Magnetic field lines can be used to determine

(a) the shape of the magnetic field

(b) only the direction of the magnetic field

(c) only the relative strength of the magnetic field

(d) both the direction and the relative strength of the magnetic field.

(iv) The magnetic field lines due to a bar magnet are correctly shown in figure

(v) Which of the following is not true about magnetic field lines?

(a) Magnetic field lines are the closed and continuous curve.

(b) No two field lines can cross each other.

(c) Crowdness of field lines represents the strength of magnetic field.

(d) The direction of field lines is from the north pole to the south pole inside a bar magnet.

75) Andre Marie Ampere suggested that a magnet must exert an equal and opposite force on a current carrying conductor, which was experimentally found to be true. But we know that current is due to charges in motion. Thus, it is clear that a charge moving in a magnetic field experience a force, except when it is moving in a direction parallel to it. If the direction of motion is perpendicular to the direction of magnetic field, the magnitude of force experienced depends on the charge, velocity (v), strength of magnetic field (B), and sine of the angle between v and B. Direction of magnetic force is given by Fleming's left hand rule.

(i) If an electron is travelling horizontally towards east. A magnetic field in vertically downward direction exerts a force on the electron along

(a) east **(b) west** **(c) north** **(d) south**

(ii) If a charged particle is moving along a magnetic field line. The magnetic force on the particle is

(a) along its velocity **(b) opposite to its velocity**

(c) perpendicular to its velocity **(d) zero**

(iii) A magnetic field exerts no force on

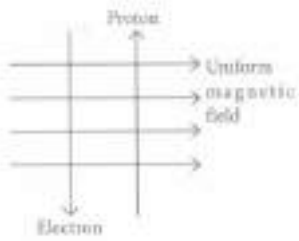
(a) a stationary electric charge

(b) a magnet

(c) an electric charge moving perpendicular to its direction

(d) an unmagnetised iron bar

(iv) A uniform magnetic field exists in the plane of paper pointing from left to right as shown in figure. In the field an electron and a proton move as shown. The electron and the proton experience



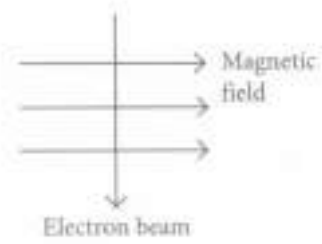
(a) forces both pointing into the plane of paper

(b) forces both pointing out of the plane of paper

(c) forces pointing into the plane of paper and out of the plane of paper, respectively

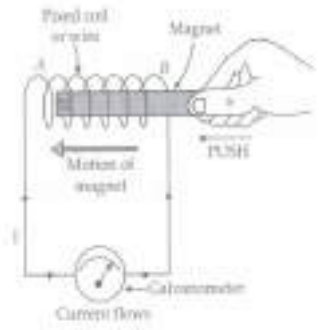
(d) force pointing opposite and along the direction of the uniform magnetic field respectively

(v) An electron beam enters a magnetic field at right angles to it as shown in the figure. The direction of force acting on the electron beam will be

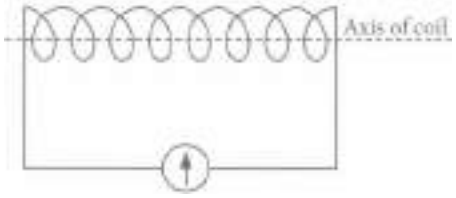


(a) to the left **(b) to the right** **(c) into the page** **(d) out of the page**

76) A current carrying wire produces magnetic field around it. The phenomena in which an electromotive force and current (if the conductor is in the form of a closed circuit) is induced by changing magnetic field (or by passing magnetic field lines) through it is called electromagnetic induction. The emf so developed is called induced emf and current made to flow is called induced current. The cause of induced emf carried out by Faraday and Henry. It can be concluded that the induced current flows in a conductor as long as the magnetic lines of force change within the conductor. In case of relative motion i.e., motion of coil w.r.t to magnet or vice versa, the direction of the current flowing in the conductor is determined by the direction of the relative motion of the conductor with respect to the magnetic field. The induced emf or current is directly proportional to the rate of change in magnetic field.



(i) A student connects a coil of wire with a sensitive galvanometer as shown in figure. He will observe the deflection in the galvanometer if bar magnet is



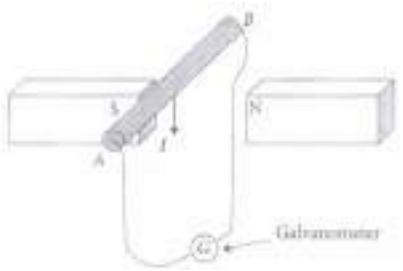
(a) placed near one of the faces of the coil and parallel to the axis of the coil

(b) placed near one of the faces of the coil and perpendicular to the axis of the coil

(c) placed inside the coil

(d) moved towards or away from the coil parallel to the axis of the coil.

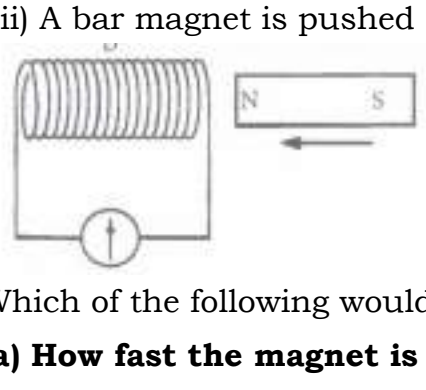
(ii) A conducting rod AB moves across two magnets as shown in figure and the needle in the galvanometer deflects momentarily. What is the name of this physical phenomenon?



(a) Electromagnetism **(b) Induced magnetism**

(c) Electromagnetic induction **(d) Static induction**

(iii) A bar magnet is pushed steadily into a long solenoid connected to a sensitive meter.



Which of the following would affect the magnitude of the deflection of the meter?

(a) How fast the magnet is pushed into the coil.

(b) The direction in which the coil is wound.

(c) The end of the solenoid the magnet enters.

(d) The pole of the magnet enters the coil first.

(iv) What is the condition of an electromagnetic induction?

(a) There must be a relative motion between galvanometer and coil of wire.

(b) There must be a relative motion between galvanometer and a magnet.

(c) There must be a relative motion between galvanometer and electric motor.

(d) There must be a relative motion between the coil of wire and a magnet.

(v) An induced emf is produced when a magnet is plunged into a coil. The magnitude of induced emf does not depend on

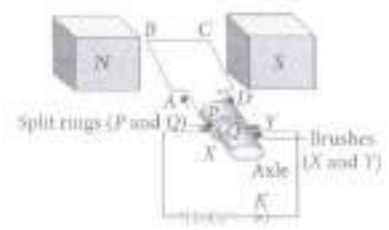
(a) the number of turns in the coil

(b) the speed with which the magnet is moved

(c) the strength of the magnet

(d) the resistivity of the material of the coil

77) An electric motor is a rotating device that converts electrical energy into mechanical energy. Electric motor is used as an important component in electric fans, refrigerators, mixers, washing machines, computers, MP3 players, etc.



An electric motor consists of a rectangular coil ABCD of insulated copper wire. The coil is placed between the two poles of a magnetic field such that the arm AB and CD are perpendicular to the direction of the magnetic field. The ends of the coil are connected to the two halves P and Q of a split ring. The inner sides of these halves are insulated and attached to an axle. The external conducting edges of P and Q touch two conducting stationary brushes X and Y respectively, as shown in the figure. Commercial motors use an electromagnet in place of a permanent magnet, a large number of turns of conducting wire in the current carrying coil and a soft iron core on which the coil is wound.

(i) Choose incorrect statement from the following regarding split rings.

(a) Split rings are used to reverse the direction of current in coil.

(b) Split rings are also known as commutator.

(c) Split ring ii a discontinuous or a broken ring.

(d) Both (a) and (b)

(ii) Which of the following has no effect on the size of the turning effect on the coil of an electric motor?

(a) The amount of the current in the coil

(b) The direction of the current in the coil.

(c) The number of turns in the coil.

(d) The strength of the magnetic field

(iii) When current is switched ON, an electric fan converts

(a) mechanical energy to chemical energy

(b) electrical energy to mechanical energy

(c) chemical energy to mechanical energy

(d) mechanical energy to electrical energy.

(iv) In an electric motor, device that makes contact with the rotating rings and through them to supply current to coil is

(a) axle **(b) brushes** **(c) coil** **(d) split rings.**

(v) In an electric motor, the direction of current in the coil changes once in each

(a) two rotations

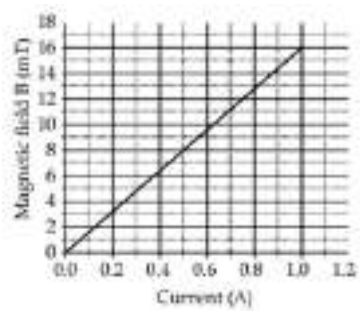
(b) one rotation

(c) half rotation

(d) one-fourth rotation

78) A solenoid is a long helical coil of wire through which a current is run in order to create a magnetic field. The magnetic field of the solenoid is the superposition of the fields due to the current through each coil. It is nearly uniform inside the solenoid and close to zero outside and is similar to the field of a bar magnet having a north pole at one end and a south pole at the other depending upon the direction of current flow. The magnetic field produced in the solenoid is dependent on a few factors such as, the current in the coil, number of turns per unit length etc.
The following graph is obtained by a researcher while doing an experiment to see the variation of the magnetic field with respect to the current in the solenoid. The unit of magnetic field as given in the graph attached is in milli-Tesla (mT) and the current is given in Ampere.

(i) What type of energy conversion is observed in a linear solenoid?



(a) Mechanical to Magnetic (b) Electrical to Magnetic
(c) Electrical to Mechanical (d) Magnetic to Mechanical

(ii) What will happen if a soft iron bar is placed inside the solenoid?

(a) The bar will be electrocuted resulting in short-circuit.
(b) The bar will be magnetised as long as there is current in the circuit.
(c) The bar will be magnetised permanently.
(d) The bar will not be affected by any means.

(iii) The magnetic field lines produced inside the solenoid are similar to that of ...

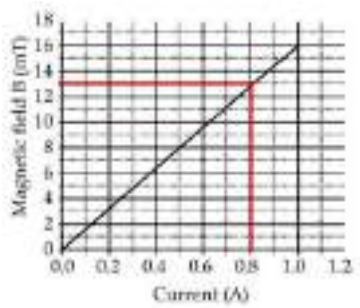
(a) a bar magnet
(b) a straight current carrying conductor
(c) a circular current carrying loop
(d) electromagnet of any shape

(iv) After analysing the graph a student writes the following statements.

I. The magnetic field produced by the solenoid is inversely proportional to the current.
II. The magnetic field produced by the solenoid is directly proportional to the current.
III. The magnetic field produced by the solenoid is directly proportional to square of the current.
IV. The magnetic field produced by the solenoid is independent of the current.

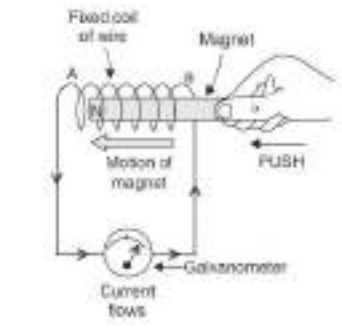
Choose from the following which of the following would be the correct statement(s).
(a) Only IV (b) I and III and IV (c) I and II (d) Only II

(v) From the graph deduce which of the following statements is correct.

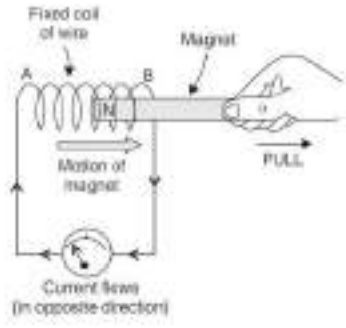


(a) For a current of 0.8A the magnetic field is 13 mT
(b) For larger currents, the magnetic field increases non-linearly.
(c) For a current of 0.8A the magnetic field is 1.3 mT
(d) There is not enough information to find the magnetic field corresponding to 0.8A current.

79) Ram is doing one experiment on Electromagnetic induction. He has a fixed coil of wire AB and he connected the two ends of the coil galvanometer. Now, he observe that when a bar magnet is held standstill inside the hollow coil of wire, then there is no deflection in the galvanometer pointer showing that no electric current is produced in the coil of wire when the magnet is held stationary in it. After that he moved bar magnet quickly into a fixed coil of wire AB. He observes that When a bar magnet is moved quickly into a fixed coil of wire AB, then a current is produced in the coil. This current causes a deflection in the galvanometer pointer [see Figure (a)]. Similarly, he observes that when the magnet is moved out quickly from inside the coil, even then a current is produced in the coil [see Figure (b)]. This current also causes a deflection in the galvanometer pointer but in the opposite direction (showing that when the direction of movement of magnet changes, then the direction of current produced in the coil also changes). So, he confirms that the current produced in this case is also alternating current or a.c.



(a) As a magnet is pushed into the fixed coil, a current is produced in the coil



(b) When the magnet is pulled out from the fixed coil, even then a current is produced in the coil (but in the opposite direction)

(i) The phenomenon of electromagnetic induction is :

(a) the process of charging a body.

(b) the process of generating magnetic field due to a current passing through a coil.

(c) producing induced current in a coil due to relative motion between a magnet and the coil.

(d) the process of rotating a coil of an electric motor.

(ii) A soft iron bar is inserted inside a current-carrying solenoid. The magnetic field inside the solenoid :

(a) will decrease (b) will increase (c) will become zero (d) will remain the same

(iii) The magnetic effect of current was discovered by :

(a) Maxwell (b) Fleming (c) Oersted (d) Faraday

(iv) The magnetic field inside a long straight solenoid carrying current :

(a) is zero (b) decreases as we move towards its end.

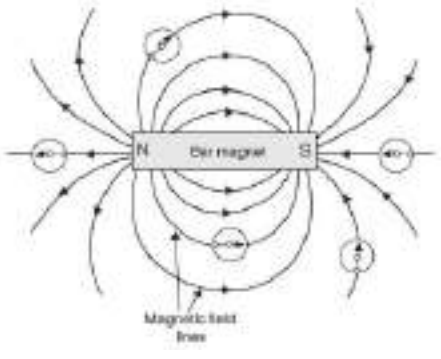
(c) increases as we move towards its end. (d) is the same at all points

(v) If the direction of electric current in a solenoid when viewed from a particular end is anticlockwise, then this end of solenoid will be :

(a) west pole (b) south pole

(c) north pole (d) east pole

80) The magnetic field pattern around a bar magnet is shown in adjoining Figure. This has been traced by using a plotting compass. The magnetic field lines leave the north pole of a magnet and enter its south pole. In other words, each magnetic field line is directed from the north pole of a magnet to its south pole. Each field line indicates, at every point on it, the direction of magnetic force that would act on a north pole if it were placed at that point. The strength of magnetic field is indicated by the degree of closeness of the field lines. Where the field lines are closest together, the magnetic field is the strongest.



(i) The magnetic field lines produced by a bar magnet :

(a) originate from the south pole and end at its north pole

(b) originate from the north pole and end at its east pole

(c) originate from the north pole and end at its south pole

(d) originate from the south pole and end at its west pole

(ii) The magnetic field lines :

(a) intersect at right angles to one another

(b) intersect at an angle of 45° to each other

(c) do not cross one another

(d) cross at an angle of 60° to one another

(iii) The north pole of earth's magnet is in the :

(a) geographical south (b) geographical east

(c) geographical west (d) geographical north

(iv) A plotting compass is placed near the south pole of a bar magnet. The pointer of plotting compass will :

(a) point away from the south pole

(b) point parallel to the south pole

(c) point towards the south pole

(d) point at right angles to the south pole

(v) Which of the following statements is incorrect regarding magnetic field lines ?

(a) The direction of magnetic field at a point is taken to be the direction in which the north pole of a magnetic compass needle points.

(b) Magnetic field lines are closed curves

(c) If magnetic field lines are parallel and equidistant, they represent zero field strength

(d) Relative strength of magnetic field is shown by the degree of closeness of the field lines