QUESTION BANK

EXERCISE - 1

Q.1 What do you conclude from Oersted's experiment ?

Q.2 Name the types of electromagnets commonly used.

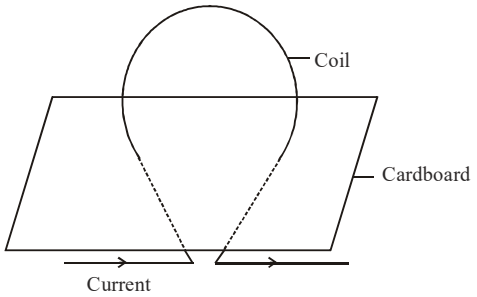
Q.3 Can we produce electricity from magnetism ?

Q.4 Does the A.C. generator have any slip ring ?

Q.5 A 0.4m wire, stretched horizontally, carries an electric current of 15A 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 ?

Q.6 A straight conductor passes vertically through a cardboard sprinkled with iron filings. Show the setting of the iron filings when a weak current is passed in the downward direction. What changes occur if,
(i) the strength of the current is increased.
(ii) the single conductor is replaced by several parallel conductors with current flowing in the same. direction.

Q.7 The diagram shows a current carrying coil passing through a sheet of stiff cardboard. Draw three lines of magnetic field on the cardboard.
State two factors on which the magnitude of magnetic field at the centre of coil, depends.



Q.8 Draw a labelled diagram to make an electromagnet from a soft iron bar. Mark the polarity at its ends. What precaution would you observe ?

Q.9 When can an electric charge give rise to a magnetic field ?

Q.10 Describe a set up for plotting the magnetic lines of force in a straight conductor.

Q.11 State a low, which determines the direction of magnetic field round a current carrying wire.

Q.12 What is the direction of magnetic field at the centre of a coil carrying current in (i) clockwise (ii) anticlockwise direction ?

Q.13 Why does a current carrying, freely suspended solenoid rest along a particular direction ?

Q.14 What is an electromagnet ? State the factors on which the strength of the magnetic field of an electromagnet depends. What is the purpose of the iron core ?

Q.15 State two ways through which the strength of an electromagnet can be increased.

Q.16 Why is soft iron used as the core of the electromagnet used in electric bell ?

Q.17 State three factors on which, the magnitude of force on a current carrying conductor placed in a magnetic field, depends. Can this force be zero for some position of the conductor ?

Q.18 How will the direction of force be changed, if the current is reversed in the conductor placed in a magnetic field?

Q.19 What is electromagnetic induction ? Describe one experiment to demonstrate the phenomenon of electromagnetic induction.

Q.20 State two factors on which the magnitude and direction of induced emf depend.

Q.21 How would you demonstrate that a momentary current can be obtained by the suitable use of a magnet and a coil of wire ? What is the source of energy associated with the current so obtained ?

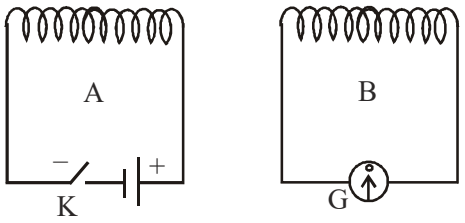
Q.22 State Fleming's right hand rule.

Q.23 State the principle of a simple a.c. generator.

Q.24 A flat coil of wire rotates at a constant rate about an axis which is at right angles to a uniform magnetic field. Indicate, with the help of a graph, how the induced emf varies during one complete rotation of the coil.

Q.25 A flat rectangular coil is rotated between the pole pieces of a horse-shoe magnet. In which position of the coil with respect to the magnetic field, will the emf (i) be maximum (ii) be zero and (iii) change direction ?

Q.26 Two coils A and B are placed as shown in figure. The coil A is connected to a battery and a key K while the coil B is connected to a centre zero galvanometer G. What will you observe in the galvanometer G when



(i) the key K is closed. (ii) the key K is opened

(iii) with the key K closed, the coil A is moved rapidly towards the coil B.

(iv) with the key K closed, the coil B is moved rapidly towards the coil A.

(v) with the key K closed, the coils A and B are moved away from each other.

Q.27 What do you mean by an electromagnet ? With the help of diagrams show the two types of electromagnets. Give two uses of electromagnets.

Q.28 How will you experimentally show that a current-carrying conductor experiences a force when kept in a magnetic field ?

Q.29 Briefly describe the principle, construction and working of an AC generator or dynamo.

Q.30 Predict the direction of induced current in the situations described by the following fig. (1) to (5).

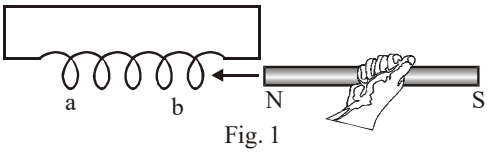


Fig. 1

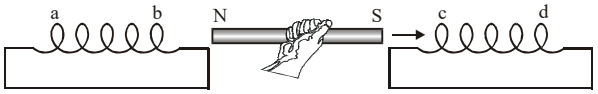


Fig. 2

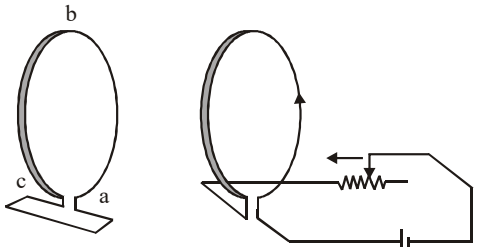


Fig. 3

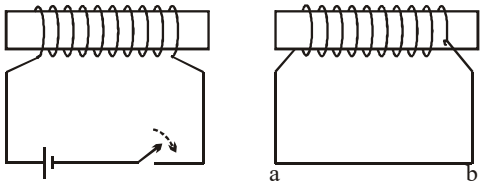


fig. 4

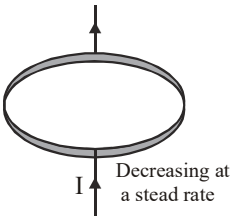


Fig.5

EXERCISE - 2

FILL IN THE BLANKS :

Q.1 A compass needle is a ..... magnet.

Q.2 Field lines are used to represent a .....

Q.3 Field lines are shown closer together where the magnetic field is .....

Q.4 A metallic wire carrying an electric current has associated with it a ..... field.

Q.5 The field lines about the wire consist of a series of concentric circles whose direction is given by the ..... rule.

Q.6 The phenomenon of ..... is the production of induced current in a coil placed in a region where the magnetic field changes with ..... The magnetic field may change due to a ..... between the coil and a magnet placed near to the coil. If the coil is placed near to a current-carrying conductor, the magnetic field may change either due to a change in the ..... through the conductor or due to the relative motion between the ..... and ..... The direction of the induced current is given by the ..... rule.

Q.7 A generator converts mechanical energy into ..... energy. It works on the basis of .....

Q.8 In our houses we receive AC electric power of ..... with a frequency of .....

Q.9 One of the wires in this supply is with red insulation, called .....

Q.10 ..... is the most important safety device, used for protecting the circuits due to short-circuiting or overloading of the circuits.

Q.11 The magnetic lines of force are the lines drawn in a magnetic field along which a ..... pole would move.
Q.12 An electric current can be used for making temporary magnets known as .....
Q.13 The unit of magnetic field is .....
Q.14 The S.I. unit of magnetic flux .....
Q.15 The frequency for A.C. (alternating current) in USA is .....

TRUE-FALSE STATEMENTS –
Q.16 An electric motor converts mechanical energy into electrical energy.
Q.17 An electric generator works on the principle of electromagnetic induction.
Q.18 The field at the centre of a long circular coil carrying current will be parallel straight lines.
Q.19 A wire with a green insulation is usually the live wire of an electric supply.
Q.20 A magnetic field exists in the region surrounding a magnet, in which the force of the magnet can be detected.
Q.21 The earth wire that has green insulation and this is connected to a metallic body deep inside earth.
Q.22 The pattern of the magnetic field around a conductor due to an electric current flowing through it depends on the shape of the conductor.

EXERCISE - 3

Q.1 Choose the correct option(s).
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.

Q.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

Q.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

Q.4 A rectangular coil of copper wires 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

Q.5 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.

Q.6 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.

Q.7 The device used for producing electric current is called a
(A) generator (B) galvanometer (C) ammeter (D) motor

Q.8 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.

Q.9 At the time of short circuit, the current in the circuit –
(A) reduces substantially(B) does not change (C) increases heavily (D) vary continuously

Q.10 A magnet is placed vertically on a paper. Then the number of neutral points obtained on the paper is –
(A) zero (B) one (C) two (D) three

Q.11 The direction of induced current is obtained by –
(A) Fleming's left hand rule (B) Right hand thumb rule
(C) Biot and Savart rule (D) Fleming's right hand rule

Q.12 A small magnet is placed perpendicular to a uniform magnet field. The forces acting on the magnetic will result in–
(A) Rotational motion (B) Translatory motion
(C) No motion at all (D) Translational and rotational motion both

Q.13 In an electric motor, conversion takes place of –
(A) Chemical energy into electrical energy (B) Electrical energy into mechanical energy
(C) Electrical energy into light (D) Electrical energy into chemical energy

Q.14 A charge of 1.6×10^{-19} coulomb enters in the magnetic field of 2 weber/m² normally with a velocity of 10^5 m/sec. The force on the charge will be –
(A) 3.2×10^{-14} N (B) 3.2×10^{-19} N (C) 1.6×10^{-14} N (D) zero

Q.15 The magnetic field at a point due to a current carrying conductor is directly proportional to the –
(A) current flowing through the conductor (B) Distance from the conductor
(C) Voltage across the conductor (D) Resistance of the conductor

Q.16 Which one of the following substances is the magnetic substances –
(A) Mercury (B) Iron (C) Gold (D) Silver

Q.17 Magnetic lines do not intersect one-another because –
(A) they are at a distance (B) they are in the same direction (C) they are parallel to another
(D) at the point intersection there will be two direction of the magnetic force which is impossible

Q.18 Instrument can be shielded from outside magnetic effects by surrounding them with –
(A) Rubber shield (B) Glass shield (C) Iron shield (D) Brass shield

Q.19 The vertical plane which passes through the magnetic axis of a freely suspended magnetic at rest is called –
(A) Magnetic meridian (B) Geographical meridian (C) North meridian (D) South meridian

Q.20 By removing the inducing magnet, the induced magnetism is –
(A) Finished after some time (B) Finished just after
(C) Not finished for a long time (D) Not charged

Q.21 The similar magnets of steel are ..... than the magnets of soft iron –
(A) stronger (B) of equal strength (C) weaker (D) none of the above

Q.22 The line joining the places which have zero value of dip is known as –
(A) aclinic line (B) Isoclinic line (C) Isogonic line (D) Isometric line

Q.23 A bar of soft iron is placed flat on the table. A bar magnet is taken and its south pole is placed on one end of the bar of soft iron. The magnet is held almost vertically. The bar is stroked from one end to the other with magnet. On the other end of the bar, magnet is lifted and again placed on the first end and the bar is again stroked. The end of the bar where the magnet is lifted will be –
(A) south pole (B) no pole (C) south and north both type (D) north pole

Q.24 The angle of decilination at a place is the angle –
(A) between the vertical plane and the geographical meridian
(B) between the vertical plane and the magnetic meridian
(C) between the geographical meridian and the magnetic meridian
(D) between the geographical meridian and horizontal plane

Q.25 The magnetism is a magnet is mainly doe to –
(A) The orbital motion of the electrons (B) The spin motion of the electrons
(C) The nuclear charge (D) None of the above

Q.26 Places of equal inclination are joined by lines on a map. These lines are known as –
(A) Aclinic lines (B) Isoclinic lines (C) Isogonic lines (D) Agonic lines

Q.27 When the north pole of a strong magnet is brought near to the north pole of a weak magnet then they will –
(A) Attract each other (B) repel each other
(C) first attract and then repel (D) first repel and then attract

Q.28 A magnet can be demagnetised by –
(A) Hammering the magnet (B) Putting it in the water
(C) Cooling it (D) Putting in contact with iron

Q.29 The effective length of the magnet is –
(A) the complete length of the magnet (B) the distance between the two poles of the magnet
(C) the half of the length of the magnet (D) the square of the length of the magnet

Q.30 When the bars of bismuth are placed between the magnetic poles they set their length –
(A) perpendicular to the lines of force (B) along the lines of force
(C) neither perpendicular nor along the lines of force (D) In any direction

Q.31 Two bars of soft iron exactly alike are given. One of them is a magnet. Without using any thing more, how would you find which is a magnet –
(A) By bringing two bars near and noting which one is attracting. The attracting one is a magnet
(B) By bringing two bars near and noting which one is repelling. One which repells is an ordinary iron.
(C) By rubbing one bar with the other and noting which becomes magnet. The bar which is magnetised is an ordinary iron
(D) One bar is placed flat horizontal on the table and the other bar is held vertical with its one end on the middle of first bar. If there is attraction between the two, the vertical bar is magnet otherwise ordinary iron.

Q.32 Magnetic storms are due to –
(A) the rotation of the earth (B) the revolution of the earth
(C) the rainy season (D) the appearance off sun spots

Q.33 The current in a generator armature is AC because
(A) the magnetic field reverses at intervals (B) the current in the field coils is AC
(C) the rotation of the armature causes the field through it to reverse
(D) the commutator feeds current into it in opposite directions every half cycle

Q.34 Lenz's law is derived from the law of conservation of –
(A) Momentum (B) energy (C) charge (D) magnetism

Q.35 Which of the following processes will not produce new magnetic poles –
(A) cutting a bar magnet in half (B) turning on a current in a solenoid
(C) running a current through a straight wire (D) placing an iron rod in contact with a magnet

Q.36 Magnetic field lines start –
(A) on N-poles (B) on S-poles
(C) on current-carrying wires (D) Nowhere

Q.37 The conductivity of a magnetic substance for the lines of force with respect to air is called the –
(A) Magnetic induction (B) magnetic permeability
(C) magnetic flux density (D) intensity of magnetisation

Q.38 Magnetic field lines form circles in the space –
(A) near a permanent magnet (B) around a current-carrying wire
(C) inside a solenoid (D) inside a current-carrying loop

Q.39 The angle of inclination of the axis of the magnetic needle to the horizontal plane when suspended freely and is at rest is known as –
(A) angle of inclination (B) angle of variation (C) angle of declination (D) none of the above

Q.40 A tesla is equivalent to a –
(A) newton per coulomb (B) newton per ampere-meter
(C) ampere per newton (D) newton per ampere-second

Q.41 The place were the angle of dip is 90° are known as –
(A) geographical poles of the earth (B) magnetic equator
(C) magnetic poles of the earth (D) none of the above

Q.42 A vertical wire carries a current upward. The magnetic field north of the wire will be directed –
(A) upward (B) eastward (C) westward (D) northward

Q.43 The magnetic flux is expressed in –
(A) dynes (B) Oerested (C) Gauss (D) Weber

Q.44 The current in the armature of a motor is reversed every half cycle due to the action of a(n)
(A) armature (B) field coil (C) brush (D) commutator.

Q.45 For dynamo which one of the following statements is correct –
(A) It converts the electrical energy into light energy
(B) It converts the kinetic energy into heat energy
(C) It converts the mechanical energy into electrical energy
(D) It converts the electrical energy into mechanical energy

Q.46 When current flows in a wire, it creates –
(A) an electric field outside (B) a magnetic field around it
(C) both the electric and magnetic fields (D) neither the electric field nor the magnetic field

Q.47 A soft iron bar in introduced inside a current carrying solenoid. The magnetic field inside the solenoid.
(A) will become zero (B) will decrease (C) will increase (D) will remain unaffected

Q.48 The magnetic lines of force, inside a current carrying solenoid, are –
(A) along the axis and are parallel to each other
(B) perpendicular to the axis and equidistance from each other
(C) circular and they do not intersect each other
(D) circular at the ends but they are parallel to the axis inside the solenoid.

Q.49 For making a strong electromagnet, the material of the core should be –
(A) soft iron (B) steel (C) brass (D) laminated steel strips

Q.50 In a moving coil galvanometer, the magnetic pole pieces are made cylindrical and a soft iron core is placed at the centre of the coil to make the magnetic field –
(A) strong (B) strong and radial (C) uniform (D) strong and uniform

Q.51 In an electric motor, the energy transformation is –
(A) from electrical to chemical (B) from chemical to light
(C) from mechanical to electrical (D) from electrical to mechanical

Q.52 In which of the following cases does the electromagnetic induction occur –
(A) a current is started in a wire held near a loop of wire
(B) the current is stopped in a wire held near a loop of wire
(C) a magnet is moved through a loop of wire (D) a loop of wire is held near a magnet

Q.53 The direction of induced current is obtained by –
(A) Fleming's left hand rule (B) Maxwell's cork-screw rule
(C) Ampere's rule (D) Fleming's right hand rule

Q.54 Which of the following has its working based on electromagnetic induction –
(A) Ammeter (B) Voltmeter (C) Transformer (D) Galvanometer

Q.55 Which of the following is not true –
(A) Induction precedes attraction (B) We cannot isolate a single pole (C) We can magnetise an iron ring
(D) A permanent magnet retains its magnetism even when heated on a flame.

Q.56 Wrist watches are made antimagnetic by shielding their machinery with –
(A) plastic sheets (B) a metal of high conductivity
(C) a magnetic substance of low permeability (D) a magnetic substance of high permeability

Q.57 Which of the following statement is not correct –
(A) The dip angle is the angle between the horizontal and earth's total magnetic field.
(B) Neutral points are obtained where the earth's magnetic field is perpendicular to that due to a magnet
(C) A magnetic field is a region in which a magnetic force can be detected.
(D) Magnetic fields are vector quantities

Q.58 When a bar magnet is broken into two pieces –
(A) we will have a single pole on each piece (B) each piece will have two like poles
(C) each piece will have two unlike poles (D) each piece will be lose magnetism

Q.59 The permanent magnets are kept with soft iron pieces at ends as keepers –
(A) to magnetise the soft iron pieces (B) to increase the strength of the magnets
(C) to avoid self demagnetisation (D) for physical safety of the magnets

Q.60 A small magnet is placed perpendicular to a constant magnetic field. The forces acting on the magnet will result in–
(A) rotation (B) translation (C) no motion at all (D) rotation as well as translation

EXERCISE - 4

MATCH THE COLUMN–

Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in **column I** have to be matched with statements (p, q, r, s) in **column II**.

Q.1 Match the following :

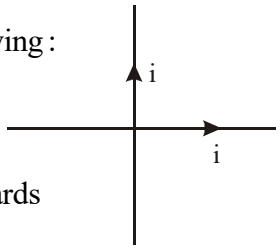
Column I	**Column II**
(A) Work done by the magnetic force may be	(p) zero
(B) Work done by the pseudo force may be	(q) ±ve, zero
(C) Frictional work	(r) Conservative
(D) Change in kinetic energy of charge particle in magnetic field	(s) Non conservative

Q.2 Column II gives approximate values of magnetic fields due to source given in column I

Column I	**Column II**
(A)At surface of neutron star	(p) 10^{-10} T
(B) Near big electromagnet	(q) 1.5 T
(C) At earth surface	(r) 10^{8} T
(D) In interstellar space	(s) 10^{-4} T

Q.3 Equal currents i flow in two wires along x and y axis as shown. Match the following :

Column I	**Column II**
(A) Magnetic field in first quadrant	(p) inwards
(B) Magnetic field in second quadrant	(q) outwards
(C) Magnetic field in third quadrant	(r) may be inwards or outwards
(D) Magnetic field in fourth quadrant	



ASSERTION & REASON TYPE

Each question contains STATEMENT-1 (Assertion) and STATEMENT-2 (Reason). Each question has 5 choices (A), (B), (C), (D) and (E) out of which ONLY ONE is correct.

(A) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.
(B) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1.
(C) Statement -1 is True, Statement-2 is False.
(D) Statement -1 is False, Statement-2 is True.
(E) Statement -1 is False, Statement-2 is False.

Q.4 **Statement 1 :** A direction current flows through a metallic rod, produced magnetic field only outside the rod.
Statement 2 : There is no flow of charge carriers inside the rod.

Q.5 **Statement 1 :** A proton moves horizontally towards a vertical long conductor having an upward electric current. It will deflect vertically downward.
Statement 2 : Seeing the proton and the conductor from the side of the proton, the magnetic field at the site of the proton will be towards right. Hence the force $\vec{F} = q\vec{v} \times \vec{B}$ will deflect the proton vertically downward.

Q.6 **Statement 1 :** Force experienced by moving charge will be maximum if direction of velocity of charge is parallel to applied magnetic field.
Statement 2 : Force on moving charge is independent of direction of applied magnetic field.

Q.7 **Statement 1 :** A neutral body may experience a net nonzero magnetic force.
Statement 2 : The net charge on a current carrying wire is zero, but it can experience a force in a magnetic field.

Q.8 **Statement 1 :** There is no change in the energy of a charged particle moving in a magnetic field although a magnetic force is acting on it.
Statement 2 : Work done by centripetal force is always zero.

Q.9 **Statement 1 :** When two long parallel wires, hanging freely are connected in series to a battery, they come closer to each other.
Statement 2 : Wires carrying current in opposite direction repel each other.

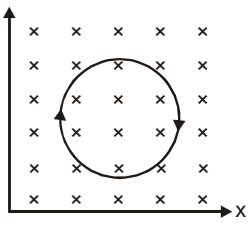
Q.10 **Statement 1 :** A solenoid tends to expand, when a current passes through it.
Statement 2 : Two straight parallel metallic wires carrying current in same direction repel each other.

EXERCISE - 5

PREVIOUS YEARS COMPETITION PROBLEMS

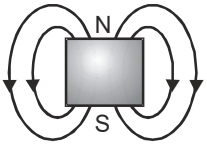
Q.1 A charged particle moves through a magnetic field in a direction perpendicular to it. Then the-
(A) Speed of the particle remains unchanged. (B) Direction of the particle remains unchanged.
(C) Acceleration remains unchanged. (D) Velocity remains unchanged.

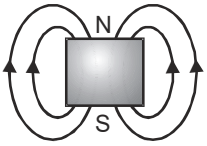
Q.2 A current carrying circular loop is placed in x-y plane fig.
Magnetic field is switched in z-direction. The loop will-
(A) Move towards + x (B) Move towards – x
(C) Contracts (D) Expands

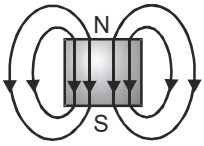


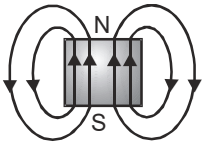
Q.3 Two long conductors, separated by a distance d carry currents I_1 and I_2 in the same direction. They exert a force F on each other. Now the current in one of them is increased to two times and its direction is reversed. The distance is also increased to 3d. The new value of the force between them is -
(A) – 2F (B) F/3 (C) – 2F/3 (D) – F/3

Q.4 The magnetic field lines due to a bar magnet are correctly shown in-

(A) 

(B) 

(C) 

(D) 

Q.5 The magnetic lines of force inside a bar magnet –
(A) are from north-pole to south-pole of the magnet.
(B) do not exist.
(C) depend upon the are of cross-section of the bar magnet.
(D) are from south-pole to north-pole of the magnet.

Q.6 The materials suitable for making electromagnets should have-
(A) low retentivity and high coercivity (B) low retentivity and low coercivity
(C) high retentivity and low coercivity (D) high retentivity and high coercivity

Q.7 A magnetic needle is kept in a non-uniform magnetic field. It experiences
(A) a force and a torque (B) a force but not a torque
(C) a torque but not a force (D) neither a force nor a torque

Q.8 Magnetic effect of current was discovered by –
(A) Faraday (B) Oersted (C) Ampere (D) Bohr

Q.9 The direction of magnetic lines of forces close to a straight conductor carrying current will be –
(A) Along the length of the conductor (B) Radially outward
(C) circular in a plane perpendicular to the conductor (D) Helical

Q.10 A current carrying wire in the neighbourhood produces –
(A) No field (B) electric field only
(C) magnetic field only (D) electric and magnetic fields

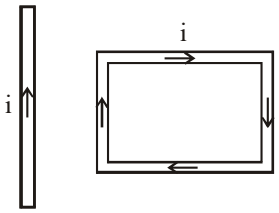
Q.11 A magnetic field can be produced by –
(A) A moving charge (B) A changing electric field (C) None of these (D) Both of these

Q.12 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

Q.13 A magnetic field
(A) Always exerts a force on a charged particle
(B) Never exerts a force on a charged particle
(C) Exerts a force, if the charged particle is moving across the magnetic field lines
(D) Exerts a force, if the charged particle is moving along the magnetic field lines

Q.14 Two free parallel wires carrying currents in opposite direction –
(A) Attract each other (B) Repel each other
(C) Neither attract nor repel (D) Get rotated to be perpendicular to each other

Q.15 A rectangle loop carrying a current i is situated near a long straight wire such that the wire is parallel to the one of the sides of the loop and is in the plane of the loop. If a steady current I is established in wire as shown in figure, the loop will –



(A) Rotate about an axis parallel to the wire
(B) Move away from the wire or towards right
(C) Move towards the wire
(D) Remain stationary

EXERCISE - 6

PREVIOUS YEAR BOARD QUESTIONS

Q.1 What constitutes the field of a magnet ?

Q.2 How can you show that the magnetic field produced by a given electric current in the wire decreases as the distance from the wire increases ?

Q.3 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?

Q.4 An alternating electric current has a frequency of 50 hz. How many times does it change its direction in one second?

Q.5 What will be the frequency of an alternating current if its direction changes after every 0.01 s?

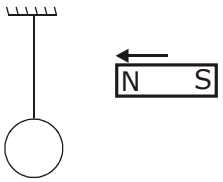
Q.6 State the rule to determine the direction of magnetic field around a current carrying conductor.

Q.7 How will the magnetic field intensity at the centre of a circular coil carrying current change, if the current through the coil is doubled and the radius is halved?

Q.8 In which direction would a compass needle align if taken a geographic (i) North and (ii) South ?

Q.9 Name the physical quantity whose S.I. unit is Wb - m^2. Is it a scalar quantity or vector quantity?

Q.10 Give the direction of induced current in the wire loop, when the magnet moves forward as shown in the figure.



Q.11 What is the difference between direct and alternating currents ?
Write one important advantage of using alternating current.

Q.12 Differentiate between short circuiting and overloading of electric circuits.
How does a fuse protect an electric circuit?

Q.13 State Faraday's law of electromagnetic induction.

Q.14 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 wire in the coil
(iii) the strength of current flowing in the coil ?

Q.15 The flow of a current in a circular loop of wire creates a magnetic field at its centre. How may existence of this field be detected ? State the rule which helps to predict the direction of this magnetic field.

Q.16 What is the relation for force experienced by a current carrying straight conductor placed in a magnetic field ? Under what condition is this force maximum ?

Q.17 (a) What is meant by a 'magnetic field' ?
(b) How is the direction of magnetic field at a point determined ?
(c) Describe an activity to demonstrate the direction of the magnetic field generated around a current carrying conductor.
(d) What is the direction of magnetic field at the centre of current carrying circular loop ?

Q.18 (a) What is an electromagnet ?
(b) List any of its two uses.
(c) What is the purpose of the soft iron core used in making an electromagnet ?

Q.19 (a) What are 'magnetic field lines' ? How is the direction of a magnetic field at a point determined ?
(b) List three properties of magnetic field lines.

Q.20 Why is pure iron not used for making permanent magnets? Name one materials used for making permanent magnets. Describe how permanent magnets are made electrically. State two examples of electrical instruments made by using permanent magnets.

Q.21 State Fleming's left hand rule. Describe the working of an electric motor. What is the function of split ring commutator in motor?

ANSWER KEY

EXERCISE - 1

(2) (i) Bar type (ii) Horse shoe type **(3)** Yes. **(4)** The A.C. generator has two slip rings. **(5)** (a) 0.6 N

(30) (1) along a $\rightarrow$ b (2) along b $\rightarrow$ a , along d $\rightarrow$ c (3) along cba
(4) along a $\rightarrow$ b (5) No induced current since field lines lie in the plane of the loop.

EXERCISE - 2

(1) small **(2)** magnetic field **(3)** greater. **(4)** magnetic **(5)** right-hand

(6) electromagnetic induction, time, relative motion, current, coil, conductor, Fleming's right-hand

(7) electrical, electromagnetic induction. **(8)** 220 V, 50 Hz. **(9)** live wire **(10)** Fuse

(11) north magnetic **(12)** electromagnets **(13)** tesla **(14)** Weber

(15) 60 Hz **(16)** False **(17)** True **(18)** True

(19) False **(20)** True **(21)** True **(22)** True

EXERCISE - 3

Q	1	2	3	4	5	6	7	8	9	10	11
A	D	C,D	D	C	D	C	A	D	C	B	D
Q	12	13	14	15	16	17	18	19	20	21	22
A	A	B	A	A	B	D	C	A	B	C	A
Q	23	24	25	26	27	28	29	30	31	32	33
A	D	C	B	B	A	A	B	A	D	D	C
Q	34	35	36	37	38	39	40	41	42	43	44
A	B	C	D	B	B	A	B	C	C	D	D
Q	45	46	47	48	49	50	51	52	53	54	55
A	C	B	C	A	A	B	D	A,B,C	D	C	D
Q	56	57	58	59	60						
A	D	B	C	C	D						

EXERCISE - 4

(1) (A) $\rightarrow$ p, (B) $\rightarrow$ q, (C) $\rightarrow$ s, (D) $\rightarrow$ p **(2)** (A) $\rightarrow$ r, (B) $\rightarrow$ q, (C) $\rightarrow$ s, (D) $\rightarrow$ p

(3) (A) $\rightarrow$ r, (B) $\rightarrow$ q, (C) $\rightarrow$ r, (D) $\rightarrow$ p

(4) (E) **(5)** (A) **(6)** (E) **(7)** (A) **(8)** (A) **(9)** (B) **(10)** (E)

EXERCISE - 5

Q	1	2	3	4	5	6	7	8	9	10	11
A	A	D	C	D	D	C	A	B	C	C	D
Q	12	13	14	15							
A	D	C	B	C							

EXERCISE - 6

(5) 50 Hz. **(7)** Four times