

6

The magnetic field lines of force:

- Always intersect each other Never intersect each other
 Intersect each other at times None of the above

7

The magnetic field lines of a current carrying conductor:

- Are always parallel to the length of the conductor Are perpendicular to the conductor
 Form concentric circles around the conductor
 Always diverge from one end of the conductor

8

Statement A: When current is flowing in the clock wise direction in a coil, it produces magnetic field directed into the plane of the paper.

Statement B: When current is flowing in the anti-clock wise direction in a coil, it produces magnetic field directed out of the plane of paper.

- Both are true Both are false A is true, B is false B is true, A is false

9

Magnetic field at any point along the current carrying conductor is:

- Zero Maximum Minimum Undetermined

10

Statement A: A current carrying solenoid behaves like a bar magnet.

Statement B: A current carrying straight conductor produces magnetic field around it.

- Both are true Both are false A is true, B is false B is true, A is false

11

A soft iron bar is inserted inside a current carrying solenoid. The magnetic field inside the solenoid will:

- Become zero Decrease Increase Remain unaffected

12

Magnets that are used In heavy electric cranes are:

- Electromagnets Permanent magnets Both None

13

For making a strong electromagnet the material of the core should be made of:

- Soft iron Steel Brass Laminated steel strips

14

The device used to detect or measure induced current is:

- Ammeter Voltmeter Galvanometer Rheostat

15

The magnetic field at any point inside a current carrying solenoid:

- Zero Decreases as we move towards its end
 Increases as we move towards its end Is the same at all points

16

Statement A: When current is flowing in the clockwise direction in a circular coil, it acts like the north pole.

Statement B: When current is flowing in the anti-clockwise direction in a circular coil, it acts like the south pole.

- Both are true Both are false A is true, B is false B is true, A is false

17

When a current carrying coil is placed in an external magnetic field, it experiences a force. The direction of force is determined by using:

- Ampere's right hand thumb rule Faraday's law Fleming's left hand rule
 Fleming's right hand rule

18

The magnetic field produced at the centre of a circular coil depends on the:

- Current passing through the coil Number of turns Radius of the coil All

19

The force acting on the coil which is placed in an external magnetic field increases with increasing the:

- Current Magnetic field Number of turns All

20

The force acting on a coil placed in an external magnetic field given by the formula $F = Bil \sin\theta$. Here l stands for:

- Length of arm of the armature coil Length of the pole
 Distance between the poles None

21

An electric motor converts electrical energy into:

- Chemical energy Mechanical energy Heat energy Light energy

22

The direction of induced current is obtained by using:

- Fleming's left hand rule Fleming's right hand rule Maxwell cork screw rule
 Ampere's rule

23

Dynamo is a device which converts mechanical energy into:

- Electrical energy Heat energy Sound energy Chemical energy

24

In an A.C generator _____ rings are used.

- Slip Split Either slip or split Neither slip nor split

25

Electromagnetic induction is the phenomenon of:

- Production of magnetic field. Production of charge.
 Rotation of the coil in the motor.
 Production of induced current by the relative motion between the magnet and coil.

26

A device that works on the principle of electromagnetic induction is:

- Voltmeter Electric motor Generator Ammeter

27

The frequency of A.C mains used in India is:

- 50 cycles per second 100 cycles per second 150 cycles per second
 200 cycles per second

28

The electrical appliance in which an electric motor is used is/are:

- Washing machines Compressors in A.C's Fans All

29

The fuse wire which is used in domestic electric circuits must have:

- Low melting point and low resistance High melting point and low resistance
 Low melting point and high resistance High melting point and high resistance

30

In domestic electric circuits, the electric power source is generally rated at ___ V and ___ Hz.

- 220, 50 220, 20 50, 220 50, 50

31

The live wire of a domestic electric circuit is generally colored ____

- Red Black Green Yellow

32

According to Fleming's right hand rule the central finger indicates the direction of the:

- Electric current Induced electric current Magnetic field Rotation of the coil

33

A charged particle is projected perpendicularly into an external uniform magnetic field. In that case, it moves along a:

- Straight line path Circular path Random path The particle remains at rest

34

A current carrying conductor experiences maximum force, when it is placed _____ to the direction of magnetic field.

- parallel normal 60° antiparallel

35

A metallic pipe carries direct current. The magnetic field exists:

- Outside only Inside only Both inside as well as outside
 Neither inside nor outside

36

A transformer works on the principle of:

- Self induction Mutual induction Momentum Energy conservation

37

Statement A: The magnetic flux through the coil is maximum when B is perpendicular to the plane of the coil.

Statement B: Faraday from his experiment concluded that, whenever the magnetic flux linked with the coil is altered an e.m.f is induced in the coil.

- Both A and B are true Both A and B are false A is true, B is false
 A is false, B is true

38

The process of sending leakage current from electrical appliances containing metallic bodies into the earth with the help of a wire is called:

- Short circuiting Over loading Earthing None

39

A step-up transformer converts

- A.C voltage to D.C voltage D.C voltage to A.C voltage
 Low A.C voltage into high A.C voltage High A.C voltage into low A.C voltage

40

Statement A: When a live wire and a neutral wire are joined, a short circuit will occur in domestic circuits.

Statement B: When too many appliances are connected to the same plug point, the stability of the circuit will increase.

- Both A and B are true Both A and B are false A is true, B is false
 A is false, B is true

41

If same amount of current passes in the same direction through two parallel long straight conductors separated by a small distance then they (neglect electrostatic repulsion) :

- Attract each other Repel each other Do not experience any force
 Rotate around each other

42

The strength of magnetic field at a point around an infinitely long current carrying conductor is:

- Directly proportional to the square of the perpendicular distance from the conductor to the point.
 Inversely proportional to the perpendicular distance from the conductor to the point.
 Inversely proportional to the square of the perpendicular distance from the conductor to the point.
 Directly proportional to the perpendicular distance from the conductor to the point.

43

Which of the following does not experience any force when kept at rest in an external magnetic field?

- Current loop Electric charge Magnetic pole Conductor

44

A proton and an α particle enter normally into a uniform external magnetic field with the same velocity. The period of rotation of the alpha particle will be _____ times that of the proton.

- four two three half

45

A current carrying circular coil behaves like a:

- Bar magnet Horse-shoe magnet Magnetic shell Solenoid

46

The current through a circular coil is halved. In order to keep the magnetic induction at the center of the coil unchanged, the number of turns should be:

- Halved Doubled Tripled Quadrupled

47

A certain current carrying coil produces a magnetic induction B at its center. If the number of turns of the coil is doubled without changing the current, then the magnetic field induction at center becomes:

- $4B$ $2B$ $B/2$ $B/4$

48

A current carrying loop of radius ' r ' carrying a current ' I ' is placed in a uniform magnetic field of induction ' B ', such that the plane of the coil is perpendicular to the field. The net force acting on the coil is:

- $2\pi r IB$ $\pi r^2 IB$ $2\pi r^2 IB$ Zero

49

The magnetic field at the center of a current carrying circular coil is:

- Directed normal to the plane of the coil Zero Directed parallel to the plane of coil
 Radial from the center of the coil

50

A particle of charge ' q ' and mass ' m ' moving with uniform velocity ' V ' enters a magnetic field of induction ' B ' normally. It takes a circular path of radius ' r ' which is proportional to:

- $\frac{1}{V}$ B m $\frac{1}{q^2}$

51

An electron and a proton enter an external magnetic field with equal velocities. Then the force experienced:

- By the electron is more By the proton is more Both experience an equal force
 Cannot be predicted

52

An electron and a proton enter a magnetic field normally with same kinetic energy. Then:

- The trajectory of the electron is less curved. Both are equally curved.
 The trajectory of the proton is less curved. Both move along a straight line.

53

The radius of curvature of the trajectory of a charged particle in a uniform magnetic field is directly proportional to the:

- Charge of the particle Energy of the particle Momentum of the particle
 Magnetic field strength

54

A proton, deuteron and an α -particle having same the kinetic energy are moving in circular trajectories in a constant magnetic field. If r_p, r_d and r_α denote the radii of their trajectories, then:

- $r_\alpha = r_p < r_d$ $r_\alpha = r_d > r_p$ $r_\alpha = r_d < r_p$ $r_p = r_d < r_\alpha$

55

The radius of curvature of the path of a particle in a uniform magnetic field is directly proportional to:

- The charge of the particle The momentum of the particle
 The energy of the particle The intensity of the magnetic field

56

A beam of charged particles is passed normally through a magnetic field. The work done on the beam by the field is:

- Zero Independent of the speed of the beam
 Dependent on the deflection of the beam Dependent on the magnetic induction B

57

A long straight wire carries a current of strength 3A. The magnetic field

63

A wire of length 'L' meter carrying current 'i' is bent in the form of a circle. The magnitude of its magnetic moment(M) is:

(use $M = iA = i\pi r^2$)

- $\frac{iL}{4\pi}$ $\frac{iL^2}{4\pi}$ $\frac{i^2L}{4\pi}$ $\frac{i^2L^2}{4\pi}$

64

A circular coil of radius 1.4 cm having 10 turns carrying a current of 7 A. The magnetic induction at its center is:

- $\pi \times 10^{-5} \text{ T}$ $\pi \times 10^{-3} \text{ T}$ $2\pi \times 10^{-5} \text{ T}$ $2\pi \times 10^{-3} \text{ T}$

65

A conductor of length 10 cm and carrying current of 1.5 A is kept in a magnetic field of $4 \times 10^{-4} \text{ T}$ normal to it. Then the force experienced by it is:

- $6 \times 10^{-5} \text{ N}$ $6 \times 10^{-4} \text{ N}$ $3 \times 10^{-5} \text{ N}$ $3 \times 10^{-4} \text{ N}$

66

A proton enters into a magnetic flux density of 1.5 T with a velocity $20 \times 10^7 \text{ ms}^{-1}$ at an angle of 30° with the field. The force on the proton is

($e_p = 1.6 \times 10^{-19} \text{ C}$)

- $2.4 \times 10^{-10} \text{ N}$ $2.4 \times 10^{-11} \text{ N}$ 3×10^{-5} 3×10^{-4}

67

If a particle of charge 10^{-12} C is moving along the x-axis with a velocity 10^5 ms^{-1} experiences a force of 10 N in Y-direction due to the magnetic field, then the magnitude and direction of magnetic field is

- $6.25 \times 10^{-3} \text{ T}$ along Z-axis 10^{-15} T along Z-axis
 $6.25 \times 10^3 \text{ T}$ along -ve Z-axis 10^8 T along -ve Z-axis

68

Two ions having equal masses but charges are in the ratio 1:2 are projected perpendicularly into a uniform magnetic field with speeds in

the ratio 2:3, then the ratio of radii of curvature along which the ions move is

- 4:3 2:3 3:2 1:4

69

The magnetic flux through a coil is directly proportional to

- number of turns area of coil magnetic induction all

70

S.I unit of magnetic flux is

- tesla web/m² weber/m weber

71

Statement A: The flux through a coil is maximum when the magnetic field induction B is perpendicular to the plane of coil.

Statement B: When a coil is placed in the magnetic field to its perpendicular direction it experience the maximum force.

- both A and B are true both A and B are false A is true, B is false
 A is false, B is true

72

If magnetic field direction is parallel to the plane of coil, then the magnetic flux through the coil is

- zero small but not zero infinity large but not infinity

73

In which of the following cases with a bar magnet and a solenoid, no induced emf is produced

- when the magnet is inserted into the solenoid
 when the magnet is withdrawn from the solenoid
 when coil is moved towards or away from the solenoid
 when relative velocity of the coil with respect to the magnet is zero

74

When ever the magnetic flux linked with the coil changes, an induced e.m.f is produced in the circuit this e. m. f lasts

- for short time
- for a long time
- for ever
- so long as the change in flux takes place

75

In the electromagnetic induction the induced charge in a coil is independent of

- change in flux
- thickness of wire
- resistance in the circuit
- number of turns

76

Assertion A: It is more difficult to push a magnet into a coil with more loops.

Reason R: The e.m.f induced in each loop resists the motion of the magnet when it is moved towards the coil.

- A and R are true and R is correct explanation of A
- A and R are true and R is not correct explanation of A
- A is true, R is false
- A is false, R is true

77

When the current through a solenoid increases at uniform rate, the induced current is

- constant and is direction of inducing current.
- constant and is opposite direction of inducing current.
- increase with time and is in the direction of incident current.
- increase with time and is in the opposite direction of incident current.

78

A.C current can't be measured with D.C ammeter, because

- A.C current can't pass through D.C ammeter
- A.C changes direction
- average value of current of a complete cycle is zero
- D.C ammeter will get damaged

79

Which of the following statements is not true about magnetic field

- magnetic lines of force do not cut each other
- inside the magnet, the lines of force go from north pole to south pole of magnet
- the magnetic lines of force form closed loops
- tangents to the magnetic lines gives the direction of the magnetic field

electric currents of 3 A and 5 A. The distance of null point from the conductor of carrying larger current and in the same direction is

- 3 cm 5 cm 12 cm 20 cm

87

A horizontal overhead power line carries a current of 50 A in west to east direction. The magnetic induction at a distance of 1.5 meter below the line is

- $5.7 \times 10^{-6} \text{ T}$ $7.7 \times 10^{-6} \text{ T}$ $6.7 \times 10^{-6} \text{ T}$ $8.7 \times 10^{-6} \text{ T}$

88

The magnetic induction at a point of distance 'r' near a long straight conductor is B. The magnetic induction at distance $\frac{r}{2}$ will be

- $\frac{B}{2}$ 2 B $\frac{B}{4}$ 4 B

89

Two circular coils of radii 20 cm and 30 cm having number of turns 50 and 100 respectively made up of same material are connected in series. The ratio of the magnetic field of induction at their centers is

- 3:2 9:4 3:4 1:3

90

Two concentric coils carry the same current in opposite directions. The diameter of the inner coil is half of the outer coil. If the magnetic field produced by the outer coil at the common center is 1 T. The net field at the center is

- 1 T 3 T 2 T zero

91

A ring of radius 'r' is uniformly charged with a charge of 'q'. If the ring is rotated with an angular frequency ' ω ', then the magnetic induction field at the center is

- $\frac{\mu_0}{4\pi} \left(\frac{q\omega}{r} \right)$ $\frac{\mu_0}{4\pi} \left(\frac{r}{q\omega} \right)$ $\frac{\mu_0}{4\pi} \left(\frac{q}{r\omega} \right)$ $\frac{\mu_0}{4\pi} \left(\frac{\omega}{qr} \right)$

92

Two flat circular coils are made up of two identical wires each of length 20 cm. One coil has number of turns 4 and other has 2. If the same current flows through the coils then the ratio of magnetic fields induction at their centers is

- 2:1 1:2 1:4 4:1

93

An electron revolves in a circular orbit of radius 0.4 \AA with speed of 10^6 ms^{-1} in a hydrogen atom. The magnetic field produced at the center of the orbit due to motion of the electron in tesla, is [

$\mu = 4\pi \times 10^{-7} \text{ H/m}]$

- 0.1 1.0 10 100

94

Two circular coils are made up of two identical wires of the same length and carrying same current. If the number of turns of the two coils are 4 and 2, then the ratio of magnetic induction at the center will be

- 4:1 2:1 1:2 1:1

95

A circular loop of radius R carrying a current 'I' is placed in a uniform magnetic field with its plane perpendicular to B. The force on the loop is

- $2 \pi R I B$ $4 \pi R I B$ $2 \pi I^2 B^3 R$ zero

96

A proton and an α -particle enter in a uniform magnetic field with the same velocity. The ratio of period of revolution of proton to that of α -particle is:

- 1:2 2:1 4:1 1:4

97

An electron moving with a velocity of $1.6 \times 10^7 \text{ ms}^{-1}$ enters a magnetic field of induction 0.91 T making an angle 90° with the field. The radius of its circular path in the field is:

- 10^{-6} m 10^{-2} m 10^{-4} m 10^{-5} m

98

A particle having a charge of $100 \mu\text{C}$ and mass 10 mg is projected in a uniform magnetic field of 25 T , with a speed of 10 ms^{-1} which is perpendicular to the field. Then the radius of path and period of revolution are _____ .

- 4 cm, 25 s 4m, 25 ms 4 cm, $25 \times 10^{-3} \text{ s}$ 4 m, 25 s

99

Two parallel wires of finite length placed at a distance of 12 cm carry electric currents of 2 A and 4 A . The distance of null point from the conductor carrying larger current, when currents are flowing in the same direction is:

- 4 cm 8 cm 12 cm 24 cm

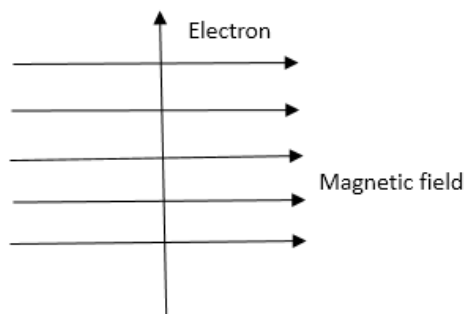
100

Two long parallel copper wires are carrying a current of 5 amps each in the opposite direction. If the wires are separated by a distance of 5 m , then force between wires is _____ .

- 10^{-5} N/m attractive 10^{-6} N/m repulsive $2 \times 10^{-6} \text{ N/m}$ attractive
 $2 \times 10^{-5} \text{ N/m}$ repulsive

101

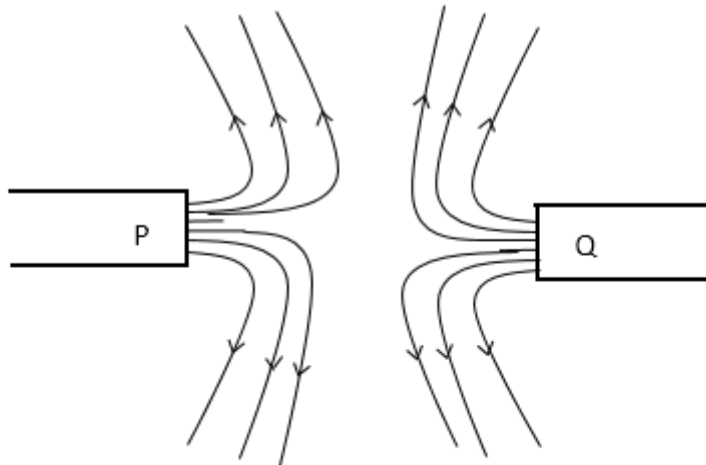
A electron enters a uniform magnetic field at right angles to it as shown in the figure the direction in which electron will move is _____ .



- Out of the plane of paper Into the plane of paper
 Right side Left side

102

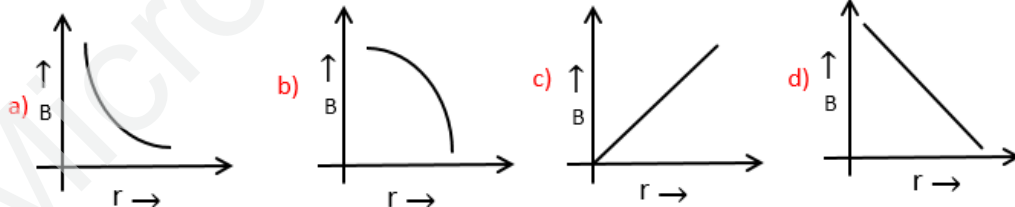
From the given figure P,Q indicates _____ .



- P - North pole ,Q - North pole
- P - North pole ,Q - North pole
- P - South pole ,Q - South pole
- P - North pole ,Q - South pole
- P - South pole, Q - North pole

103

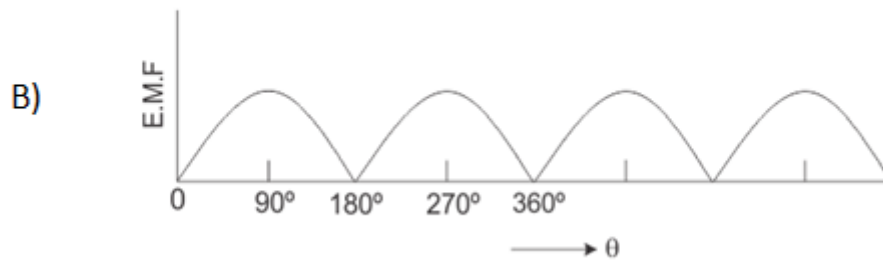
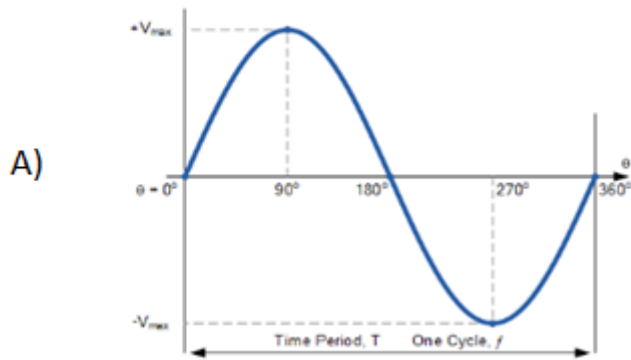
Which of the following shows the variations of magnetic induction B with distance from a long wire carrying a current _____ .



- a
- b
- c
- d

104

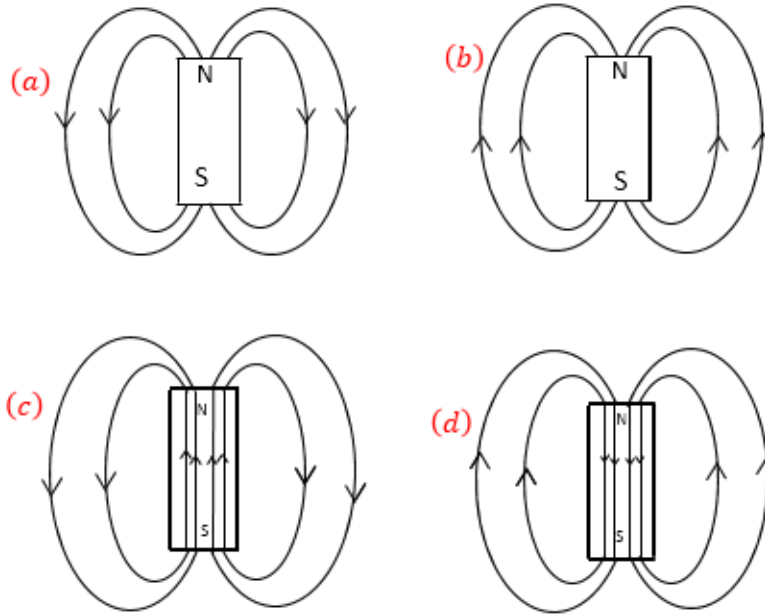
The following graph indicates



- A indicates AC current, B indicates DC current
- A indicates AC current, B indicates DC current
- A indicates DC current, B indicates AC current
- Both A and B indicate AC current
- Both A and B indicate DC current

105

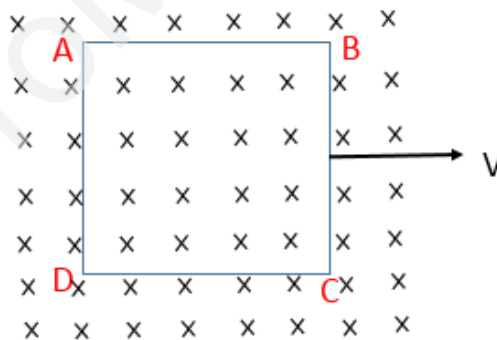
The magnetic field lines due to a bar magnet are correctly shown in ____ .



- a
 b
 c
 d

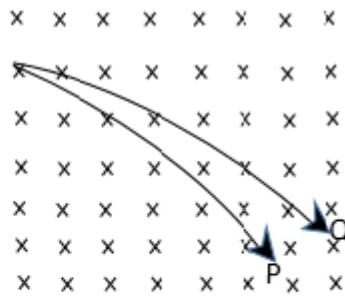
106

A metallic square loop ABCD is moving in its own plane with velocity V in a uniform magnetic field perpendicular to its plane as shown in the figure (magnetic field direction is perpendicularly into the plane of paper). Electric field is induced in _____



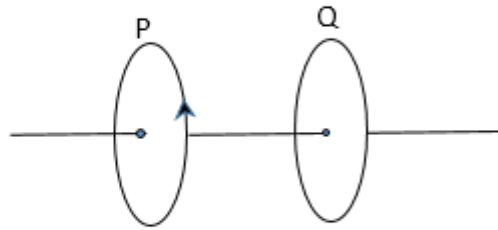
- AD but not in BC
 BC but not in AD.
 Neither in AD nor in BC.
 Both AD and BC Both AD and BC

Two charged particles P and Q enter a uniform magnetic field normally with the same speed. Their paths in the field are as shown in the figure. (B into the plane of page). It can be concluded that _____ .



- The charge of P is greater than that of Q.
- The specific charge of P is greater than that of Q.
- Both P and Q are positively charged.
- Both P and Q are negatively charged.

Two circular loops P and Q are placed with their planes parallel to each other. A current is flowing through P. If this current is increased, then _____

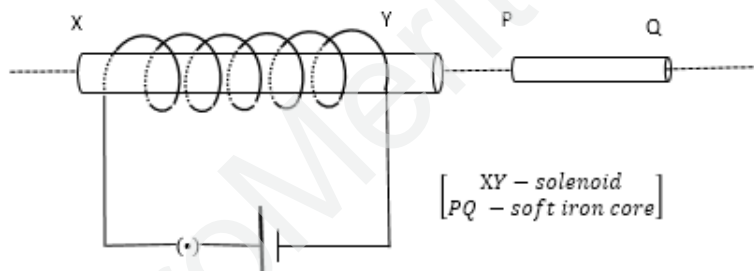


- (a) The loops will attract each other
- (b) The loops will repel each other
- (c) The loops will neither attract nor repel each other.
- (d) Loop Q will start rotating.

a b c d

109

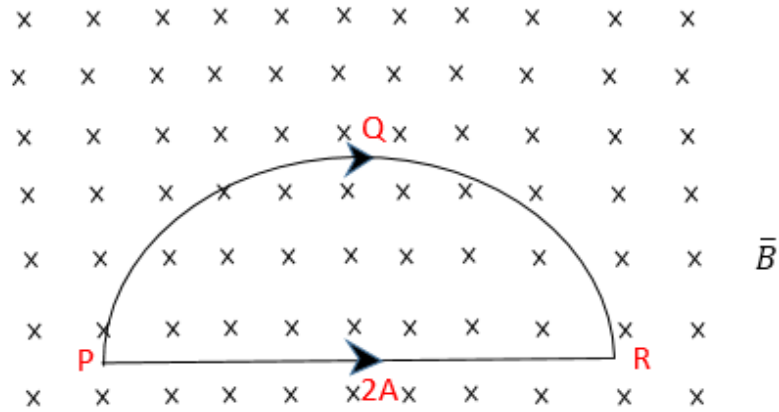
In the figure, the initial force between the cylinder and the solenoid would be much greater if the card board tube was replaced by one made from



Plastic Aluminium Copper Steel Steel

110

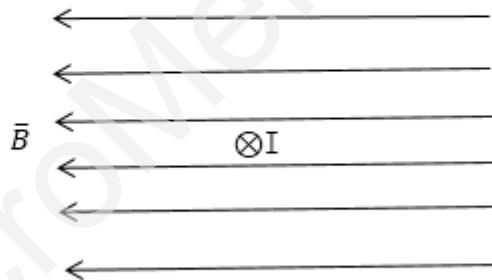
A semi circular current loop is placed in a uniform magnetic field of 1 T as shown. If the radius of loop is 1 m, the magnetic force on the loop is _____ .



- 4N 4N
 8N
 $8/\pi$
 Zero

111

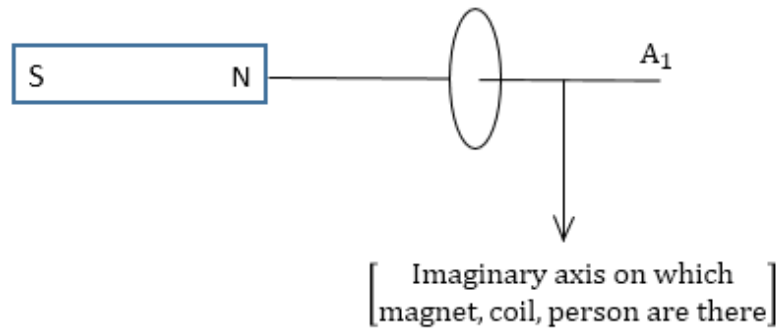
The figure shows a uniform magnetic field \vec{B} directed to the left and a wire carrying a current into the page. The magnetic force acting on the wire is _____ .



- Towards the top of the page
 Towards the bottom of the page
 Towards the left
 Towards the right

112

The figure shows a circular coil with bar magnet on its axis. If coil is moved towards magnet, direction of current as seen by observer at A, is ____ .



- Clockwise Clockwise
 Anti-clockwise
 First clock wise and then anti-clockwise
 There is no induced current in the coil

113

Match the following	
a. Fleming's left hand rule	1. due to current element
b. Ampere's palm rule	2. direction of induced current
c. Biot savart's law	3. direction of force on conductor
d. Fleming's right hand rule	4. B to uniform current

- a-3, b-2, c-4, d-4
 a-4, b-3, c-2, d-1
 a-3, b-4, c-1, d-2
 a-3, b-4, c-1, d-2
 a-2, b-4, c-1, d-3

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