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Magnetic Effects of Electric Cuurent

* A positively charged particle moving with velocity v ¯¯¯ enters a region having a constant magnetic field B.The particle will experience maximum force when the angle between the vectors B and V is

a)45^0

b)90^0

c)180^0

d)30^0

* The frequency of charged particle moving at right angles to the magnetic field, is independent of

a) The radius of the circular trajectory

b) Speed of the particle

c) Both (a) & (b)

d) The magnetic field

* A charge moving in the positive x- direction is subjected to a magnetic field in the negative x- direction. As a result the charge will

a) Retard along the x-axis

b) Moving along a helical path around the x-axis

c) Remain unaffected

d) starts moving in a circular path

* A uniform magnetic field acts at right angles to the direction of motion of the electron. As a result of this the electron describes a circular path of radius 2cm. If the speed of the electron is doubled, the radius will become

a)4cm

b)2cm

c)1cm

d)8cm

* Uniform electric field and uniform magnetic field are in the same direction. An electron is projected also in the same direction

  a) Its velocity willincrease in magnitude

  b) Its velocity will be decrease in magnitude

  c) Will turn to its left

  d) Will turn to its right

* The work done by a magnetic field on a moving charged particle is

  a) Zero because the force acts parallel to velocity

  b) Position because the force acts perpendicular to the velocity

  c) Zero because the force acts perpendicular to the velocity

  d) Negative because the force acts parallel to the velocity

* Radius of curvature of the path of a charged particle in a uniform magnetic field is directly proportional to

  a) Momentum of the particle

  b) Intensity of the field

  c) Charge on the particle

  d) Energy of the particle

* When a charged particle moves in a magnetic field, its kinetic energy

  a) Always increased

  b) Always decreased

  c) Remains constant

  d) May increase or decrease depending on the direction of projection and magnetic field

* A beam of protons is deflected sideways. This deflection might be caused by

  a) Magnetic field only

  b) Electric field only

  c) Either Electric field or magnetic field

  d) Both electric and magnetic field

* A charged particle is whirled in a horizontal circle on a frictionless table by attaching it to a stringFixed at one point. If the magnetic field is switched on in the vertical direction, the tension in the string

a) Will increase

b) Will decrease

c) Will remain the same

d) May increase or decrease

* A vertical wire carries a current in the upward direction. An electron beam sent horizontally

Towards the wire will be deflected

a) Towards right

b) Towards left

c) Upwards

d) Downwards

* A current carrying straight wire is kept along the axis of a circular loop carrying a current. Thestraight wire will

a) Exert an inward force on the circular loop

b) Exert an outward force on the circular loop

c) Not exert any force on the circular loop

d) Exert a force on the circular loop parallel to itself

* A circular loop is kept in that vertical plane which contains the north-south direction. It carries a current that is towards north at the top most point. Let A be a point on the axis to the east of it and B a point on this axis to the west of it. The magnetic field due to the loop

a) is towards east at A and towards west at B

b) is towards west at A and towards east at B

c) Is towards east at both A and B

d) Is towards west at both A and B

* Consider the situation shown in the figure. The straight wire 1carrying current I_1 is fixed but the loop 2 carrying current I_2 can move under the magnetic force. The loop will

a) Remain stationary

b) Move towards the wire

c) Move away

d) Rotate about the wire

* 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

* A particle is projected in a plane perpendicular to a uniform magnetic field. The area bounded by the path described by the particle is proportional to

a) The velocity

b) The momentum

c) The kinetic energy

d) None

* A long solenoid carrying a current produces a magnetic field B along its axis. If the current is

Doubled and the number of turns per cm is halved, the new value of the magnetic field is

a) B/2

b) B

c) 2B

d) 4B

* The magnetic field at a point distance 4 cm from a long current carrying wire is 10^{-3} T. The field at a distance 1 cm from the same wire is

a) 2 (10^{-4}) T

b) 3(10^{-4}) T

c) 4 (10^{-3}) T

d) 1.11(10^{-4}) T

* If B_1 is the magnetic field at a point on the axis of a circular coil of radius R at a distance of *R*

3 and B_2 is the magnetic field at the center of the coil, then ratio of $B_1 : B_2$ is

a) 1 : 3

b) 1 : 4

c) 1 : 8

d) 1 : 2

* Two straight long wires carry a current I in the same direction and are set parallel to each other separated by a distance of 2r. The strength of the magnetic field at a distance r between them is

a) Zero

b) 4I/r

c) 2I/r

d) I/r

* A charge q coulomb moves in a circle of radius r meters at n rps. The magnetic field at the center of the circle is

a) $\frac{2\pi}{r} NA^{-1}m^{-1}$

b) $\frac{2\pi}{n} 10^{-7} NA^{-1}m^{-1}$

c) $\frac{2\pi}{r} 10^{-7} NA^{-1}m^{-1}$

d) $\frac{2}{r} 10^{-7} NA^{-1}m^{-1}$

* A wire is carrying a current from east to west. The direction of magnetic field above it is

a) East to west

b) West to east

c) South to north

d) North to south

* A circular loop of area 0.02 m^2 carrying a current of 10 A is placed with its plane perpendicular to the magnetic field 0.2 T. The torque acting on the loop is

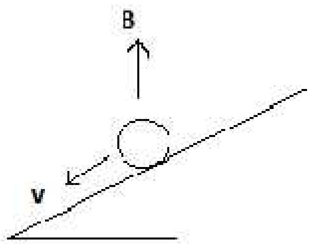
a) 0.01 Nm

b) 0.001 Nm

c) Zero

d) 0.8 Nm

* A conducting rod of length L carrying a current I perpendicular to the paper and inwards is moving down the smooth inclined plane of inclination a Θ with the horizontal with a uniform speed v. A vertically upward magnetic field B exists in the space as shown. The magnitude of the magnetic field is



a) $\frac{m}{L}$ sin Θ

b) $\frac{m}{L}$ cos Θ

c) $\frac{m}{I}$ tan Θ

d) $\frac{m}{I\ s\ \theta}$

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