PHYSICS MDCAT

Electromagnetism

TEST#06 (UNIT # 9)

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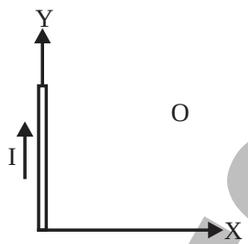
Q.86 A current is flowing towards north along a power line. The direction of magnetic field above it, neglecting the earth's field, is:

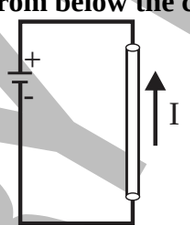
A) North
B) South
C) East
D) West

Q.87 Due to straight conductor carrying electronic current, the wrong statement out of the following is:



A) Magnetic field at point O will be parallel to x-axis
B) Magnetic field at point O will be parallel to z-axis
C) Magnetic lines of force are concentric circles with wire at centre
D) Magnetic field to the left and right of the wire are oppositely directed

Q.88 Electronic current is flowing through a straight conductor as shown in figure. The direction of magnetic lines of force when seen from below the conductor will be:



A) Clockwise
B) Anticlockwise
C) Top to bottom
D) Bottom to top

Q.89 A current carrying straight wire is kept along the axis of a solenoid carrying a current. The straight wire:

A) Will exert an inward force on the solenoid
B) Will exert an outward force on the solenoid
C) Will not exert any force on the solenoid
D) Will exert a force on the solenoid parallel to itself

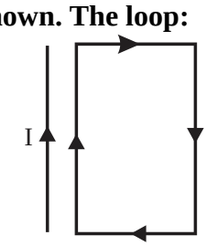
Q.90 A proton beam is going from north to south and an electron beam is also going from north to south. Neglecting the earth's magnetic field, the electron beam will be deflected:

A) Towards the proton beam
B) Upwards
C) Away from the proton beam
D) Downwards

Q.91 Two infinitely long wires carrying same currents in opposite directions. Then the magnetic field at a point P lying midway between them is:

A) Twice the field due to each wire alone
B) Half of the field due to each wire alone
C) Fourth times of the field due to each wire alone
D) Zero

Q.92 A rectangular loop carrying electronic current is placed near a long straight fixed wire carrying electronic current as shown. The loop:



A) Experiences no force
B) Experiences a force towards wire
C) Experiences a force away from wire
D) Experiences a torque but no force

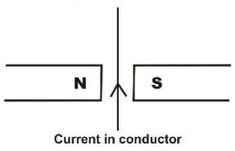
Q.93 A 50 cm wire carrying current of 20 A is placed in a magnetic field of strength 0.75 T. If wire makes an angle 30° with the field. The magnitude of force on wire is:

A) 4.50 N
C) 5.75 N
B) 3.75 N
D) 6.50 N

Q.94 A straight wire of length 1.5 m and carrying a current of 2.5 A is placed in a uniform magnetic field of induction 0.5 T. The magnetic field is perpendicular to the length of wire. The force per unit length (in Nm^{-1}) on the wire is:

A) 1.25
C) 3.75
B) 2.50
D) 5.25

Q.95 The diagram shows an electronic current in a conductor in a magnetic field. What is the direction of the force on the conductor?



A) Into the page
C) Towards the N-pole
B) Out of the page
D) Towards the S-pole

Q.96 Applying the "Right hand palm rule" for a straight conductor carrying current and placed in an external magnetic field, if the fingers are along east and thumb is directed along north, the direction of magnetic force will be:

A) Vertically upwards
C) Towards east
B) Vertically downwards
D) Towards south

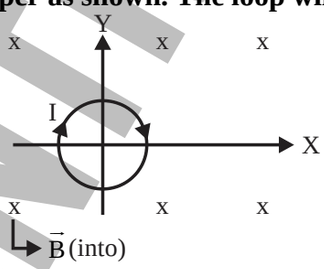
Q.97 The force acting on one meter length of the conductor placed at right angle to the magnetic field when one ampere current is passing through it is called_____:

A) Magnetic field strength
C) Magnetic field
B) Magnetic dipole moment
D) Magnetic charge density

Q.98 A cable carries a current of 2 A vertically downward. The magnetic field produced by it at a point 10 cm north will be:

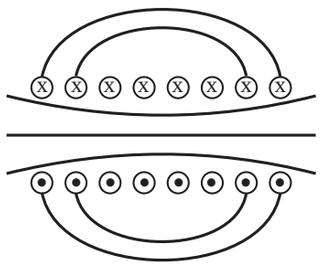
A) 2×10^{-6} tesla west
C) 4×10^{-6} tesla west
B) 2×10^{-6} tesla east
D) 4×10^{-6} tesla east

Q.99 A conducting loop carrying electronic current I is placed in a uniform magnetic field pointing into plane of the paper as shown. The loop will have a tendency to:



A) Contract
C) Move towards x-axis
B) Expand
D) Move towards y-axis

Q.100 For the solenoid shown the direction of magnetic field outside solenoid (if outside field is not ignored) is:



A) Clockwise
C) Left to right
B) Anticlockwise
D) Right to left

Q.101 A solenoid is 1.0 m long and it has 4250 turns. If a current of 5.0 A is flowing through it, what is the magnetic field at its centre?

A) 5.4×10^{-2} T
C) 1.35×10^{-2} T
B) 2.7×10^{-2} T
D) 0.675×10^{-2} T

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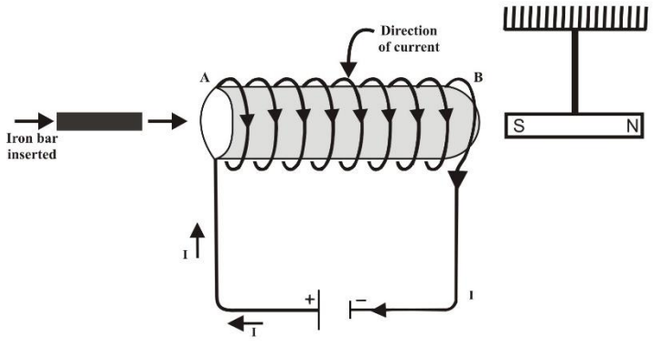
Q.102 In a current carrying long solenoid, the magnetic field produced does not depend upon

A) Number of turns per unit length
C) Radius of solenoid
B) Current flowing
D) All of these

Q.103 The diagram shows a small magnet hanging on a thread near the end of a solenoid carrying steady current I?



What happens to the magnet as the iron core is inserted into the solenoid?

A) It moves towards the solenoid
B) It moves away from the solenoid
C) It moves towards the solenoid and rotates through 180°
D) It moves away from the solenoid and rotates through 180°

Q.104 A proton is moving with velocity $\vec{v}$ in a direction opposite to the direction of magnetic field $\vec{B}$. The magnetic force experienced by the proton is:

A) Bev
C) -Bev
B) Bv
D) Zero

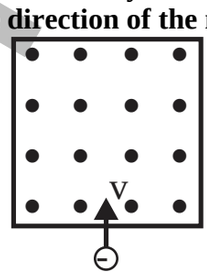
Q.105 A positively charged particle projected towards west is deflected towards north by a magnetic field. The field must be:

A) Towards west
C) Towards south
B) Upward
D) Downward

Q.106 A charged particle enters in a strong magnetic field. Then its kinetic energy:

A) Increases
B) Remains constant
C) Decreases
D) First increases and then becomes constant

Q.107 A negative charge moving with constant velocity v enters a region of uniform magnetic field pointing out of the page. What is the direction of the magnetic force on the charge?



A) Left wards
C) To the bottom of page
B) Right wards
D) To the top of the page

Q.108 A charge is projected with 20 m s^{-1} velocity in a magnetic field of 5 T at an angle of 30°. If force of 5.0×10^{-17} N is exerted on the charge, then value of charge will be:

A) 1.6×10^{-19} C
C) 4.8×10^{-19} C
B) 2.7×10^{-19} C
D) 9.6×10^{-19} C

Q.109 The force on a charge moving in a magnetic field is not independent of:

A) Area of conductor
C) Length of conductor
B) Velocity of charge
D) Both A and C

Q.110 An electron moves in a circular arc of radius 10 m at a constant speed of 2×10^{7} m s^{-1} with its plane of motion normal to a magnetic flux density of 10^{-5} T. The specific charge of the electron is:

A) 2×10^{2} C kg^{-1}
C) 5×10^{6} C kg^{-1}
B) 2×10^{5} C kg^{-1}
D) 2×10^{11} C kg^{-1}

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Q.111 The radius of curvature of the path of a charged particle in a uniform magnetic field is directly proportional to:

A) The charge on the particle
C) The intensity of the field
B) The momentum of the particle
D) Both A & B

Q.112 An electron (mass = 9.0×10^{-31} kg and charge = 1.6×10^{-19} coulomb) is moving in a circular orbit in a magnetic field of 1.0×10^{-4} weber/m^2. Its period of revolution is:

A) 3.5×10^{-7} second
C) 1.05×10^{-6} second
B) 7.0×10^{-7} second
D) 2.1×10^{-6} second

Q.113 A long solenoid has n turns per metre and current *I* A is flowing through it. The magnetic field at the ends of the solenoid is:

A) $\frac{\mu_o nl}{2}$
C) Zero
B) $\mu_o nl$
D) $2\mu_o nl$

Q.114 The vector sum of electric and magnetic force is called:

A) Maxwell force
C) Lorentz force
B) Newton's force
D) Centripetal force

Q.115 The value of e/m is smallest for:

A) Proton
C) Electron
B) β-particle
D) Positron

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