

Magnetism Test Review (A, B and C)

⚠ This is a preview of the draft version of the quiz

Started: Sep 18 at 11:05pm

Quiz Instructions

Question 1

1 pts

A positively charged particle in a uniform magnetic field moves in a circular path in the counter-clockwise direction, parallel to the plane of the page. In what direction do the magnetic field lines point?

- Out of the page
- To the left
- In a counter-clockwise pattern parallel to the plane of the page
- Into the page
- To the right

Question 2

1 pts

What is the magnetic force experienced by a negatively charged particle of 1.0 C that is moving upward at a velocity of 2.0×10^3 m/s in a magnetic field of strength 4.0×10^{-4} T, directed into the page?

- (C) 2.0×10 N to the left
- (A) 0.8 N to the left
- (B) 0.8 N to the right

(D) 2.0×10^7 N to the right

(E) 5.0×10^7 N to the left

Question 3**1 pts**

A charged particle is moving in a circular orbit in a magnetic field. If the strength of the magnetic field doubles, how does the radius of the particle's orbit change?

It is quadrupled

It is halved

It is unchanged

It is doubled

It is quartered

Question 4**1 pts**

A current-carrying wire in a magnetic field is subject to a magnetic force. If the current in the wire is doubled, what happens to the magnetic force acting on the wire?

It is quartered

It is unchanged

It is halved

It is quadrupled

It is doubled

Question 5**1 pts**

A wire carries a current, I . At a distance of r , the magnitude of the magnetic field is B . If both the current in the wire and the distance from the wire are doubled, the magnitude of the magnetic field changed by a factor of

- 1
- 4
- 1/4
- 1/2
- 2

Question 6**1 pts**

Which of the following fields CANNOT change the speed of the object that is acted upon by each field?

- I. Uniform gravity fields
- II. Uniform electric fields
- III. Uniform magnetic fields

- I only
- III only
- II only
- Both II and III
- Both I and II

Question 7**1 pts**

Which of the following is/are true concerning magnetic forces and fields? Select two answers.

- The kinetic energy of a charged particle can be increased-by a magnetic force.
- A charged particle can move through a magnetic field without feeling a magnetic force.
- A moving charged particle generates a magnetic field.
- The magnetic field lines due to a current- carrying wire radiate away from the wire.

Question 8**1 pts**

The velocity of a particle of charge $+5.0 \times 10^{-9}$ C and mass 3×10^{-4} kg is perpendicular to a 0.12-tesla magnetic field. If the particle's speed is 5×10^4 m/s, what is the acceleration of the particle in m/s/s?

Question 9**1 pts**

An experiment is performed with a long current carrying wire in a region free from any other magnetic fields. The current is varied and the field strength is recorded. Which of the following statements about a graph of B versus I is true?

- The slope of the graph is directly proportional to the square of the distance the magnetic field

strength was measured from the wire.

- The slope of the graph is inversely proportional to the distance the magnetic field strength was measured from the wire.
- The slope of the graph is inversely proportional to the square of the distance the magnetic field strength was measured from the wire.
- The slope of the graph is directly proportional to the distance the magnetic field strength was measured from the wire.

Question 10**1 pts**

A straight wire of length 3 m carries a 8-amp current. How strong is the magnetic field at a distance of .002 cm from the wire in Teslas?

Question 11**1 pts**

Two long, straight wires are hanging parallel to each other and are .01 cm apart. The current in Wire 1 is 500 A, and the current in Wire 2 is 100 A, in the same direction. What is the magnetic force per unit length felt by the wires in N/m?

Question 12**1 pts**

A charge moves in a circular orbit of radius R due to a uniform magnetic field. If the velocity of the charge is tripled, the orbital radius will become _____.

$R/3$

R

$3R$

$9R$

Question 13

1 pts

Inside a solenoid, the magnetic field

decreases along the axis

is zero

increases along the axis

is uniform

Question 14

1 pts

Three centimeters from a long, straight wire, the magnetic field produced by the current is determined to be equal to 9×10^{-5} T. The Amps of current in the wire must be _____ A.

Question 15**1 pts**

Magnetic field lines determine

- the relative strength of the field
- both the relative strength and the direction of the field
- only the direction of the field
- only the shape of the field

Question 16**1 pts**

The back emf on an electric motor greatest when

- the motor is first turned on
- the speed of the motor is constant
- the speed of the motor is increasing
- the speed of the motor is at its maximum value

Question 17**1 pts**

A bar magnet is pushed through a flat coil of wire. The induced emf is greatest when

- the magnet is pushed through quickly
- the south pole is pushed through first

- the north pole is pushed through first
- the magnet is pushed through slowly

Question 18**1 pts**

The magnetic flux through a wire loop is independent of

- the strength of the magnetic flux
- the area of the loop
- the orientation of the magnetic field and the loop
- the shape of the loop

Question 19**1 pts**

A flat, 5000-turn coil has a resistance of 2. The coil covers an area of 10 cm^2 in such a way that its axis is parallel to an external magnetic field. At what rate in T/s must the magnetic field change in order to induce a current of 0.5 A in the coil?

Question 20**1 pts**

When a loop of wire is turned in a magnetic field, the direction of the induced emf changes every

- one-quarter revolution
- two revolutions
- one revolution
- one-half revolution

Question 21**1 pts**

A wire of length 115 m is passed through a magnetic field with a strength of 40.2 T. What must be the velocity in m/s of the wire if an emf of 10.5 V is to be induced?

Question 22**1 pts**

A device that transforms mechanical energy into electrical energy is called a

- Generator
- Motor
- Transformer
- Inductor

Galvanometer

Question 23**1 pts**

A wire carrying 25.0 V is applied to a transformer. The primary coil has 50 turns and the secondary coil has 100 turns. What is the emf in Volts induced in the secondary coil?

Question 24**1 pts**

A proton traveling at 35.0×10^5 m/s crosses the screen to the right. The proton enters a B-field of 400,000,000 T that is directed toward the top of the page. The magnitude of the force acting on the proton is _____ $\times 10^{-4}$ N.

Question 25**1 pts**

A pair of bar magnets is used to show the direction of the magnetic field relating to the north and south poles of the magnets. Iron filings sprinkled around the magnets will indicate that the field produces

no interaction with either magnet

- an attraction field when placed in the region between a north and a south pole
- concentric circles of iron filings around the magnet
- a repulsive field when placed in the region between a north and a south pole

Question 26**1 pts**

A bar magnet suspended from its midpoint in a horizontal plane will align itself with the Earth's magnetic field with its north end pointing north.

- The magnitude of the forces between the bar magnet and the Earth is the same since they are action-reaction pairs.
- The force the bar magnetic exerts on the Earth is larger because the bar magnet is suspended by a string and free to rotate.
- The force that the Earth exerts on the bar magnet is greater that the force the bar magnet exerts on the Earth because the Earth's magnetic field is much larger.
- There is only a gravitational force acting between the magnet and the Earth.

Question 27**1 pts**

Iron filings sprinkled around a bar magnet are good materials to use to indicate the strength and direction of the magnetic field associated with a magnetic pole or a pair of magnetic poles because

- they are non-magnetic materials and will not affect the magnetic field of the bar magnet(s)
- they are weakly magnetic and do not interfere with magnetic field of the bar magnet(s)
- the domains in the iron filings can be affected by the field of a strong magnet so that they orient themselves with the field of the magnet(s) showing the field direction around the magnet(s)

- since they are weakly repelled by the external magnetic field of the bar magnet(s) they do not crowd together along the magnet field lines associated with the bar magnet(s)

Question 28**1 pts**

A circular coil is placed on a horizontal surface. Initially a bar magnet is held above it with the N-pole pointing downward to the coil. When the magnet is moved toward the coil, it induces

- no current in the coil since it is not connected to power supply
- an alternating current in the coil
- a current in the coil that is counterclockwise as viewed from above
- a current in the coil that is clockwise as viewed from above

Question 29**1 pts**

Magnetic field lines produced by a long straight wire carrying a current are

- are concentric circles around the wire
- in the same direction as the current in the wire
- are directed radially outward from the wire
- in the opposite direction as the current in the wire

Question 30**1 pts**

In which of the following cases would a uniform magnetic field B exert the largest magnitude of force on a charged particle?

- the charge is 3 C and is placed stationary in the magnetic field
- the charge is 2 C and is moving at velocity v directly along the magnetic field
- the charge is 1 C and is moving at an angle of 60° to the direction of the magnetic field
- the charge is 1 C and is moving at velocity v perpendicular to the magnetic field line

Question 31

1 pts

Which of the following statements describes the magnetic field around a long, straight, current-carrying wire?

- the magnetic field is along the wire in the opposite direction as the current and is stronger nearest the wire
- the magnetic field is in a helical pattern around the wire and is of uniform strength along the direction that the helix spirals around the wire
- the magnetic field is in a circular pattern around the wire and is nearest the wire
- the magnetic field is along the wire in the same direction as the current and is stronger nearest the wire

Question 32

1 pts

Which of the following statements best describes Earth's magnetic field?

- Earth's magnetic field may be related to an iron-nickel core and the spin of the planet.

- Earth's magnetic field lies along tire direction that the north magnetic pole of a compass points.
- Earth's magnetic field has its current south magnetic pole in northern Canada.
- All of these

Question 33**1 pts**

The strong magnetic field of a material such as neodymium is due primarily to

- how electrons are paired in atoms of the material
- all of these
- the alignments of atoms within the material
- the spin nature of electrons in the atom

Question 34**1 pts**

A charged particle moves into a region with a uniform magnetic field and is observed to move in a circular path in the field. A second charged particle is sent into the field in the same direction but at twice the speed. What difference in the particle's paths will be observed?

- The second particle will move in circle with a smaller radius
- There will be no difference in the paths of the two particles
- The second particle will not move in a circular path in the magnetic field.
- The second particle will move in a circle with a larger radius

Question 35**1 pts**

A coil of wire with N turns has a radius of R and a current of I . Which of the following actions will increase the strength of the magnetic field inside the coil?

- Insert an iron rod into the middle of the coil.
- Reduce the current in the coil.
- Reduce the number of turns of wire in the coil.
- None of these actions will increase the magnetic field.

Saving...

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