

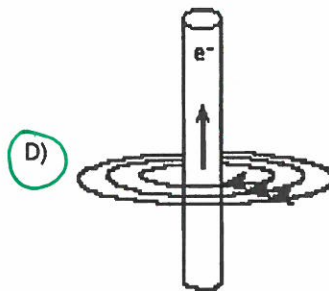
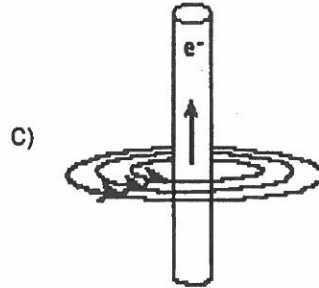
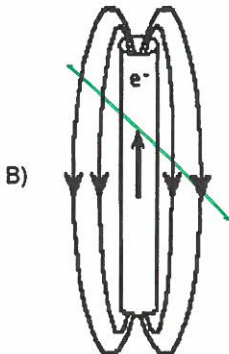
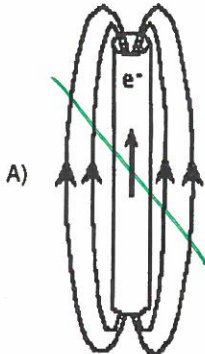
Hand Rules

old Regents mc

Name: _____

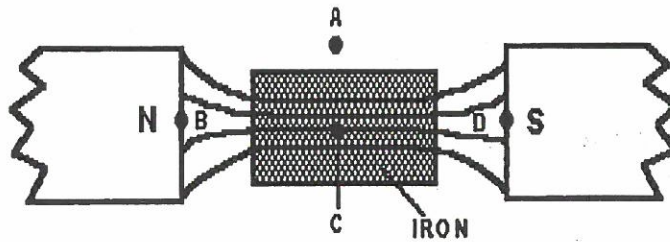
- 1) An electron current (e^-) moving upward through a straight conductor creates a magnetic field. Which diagram below correctly represents this magnetic field?

Left Hand



Awkward thumbs up

- 2) The diagram below shows the magnetic field that results when a piece of iron is placed between unlike magnetic poles.

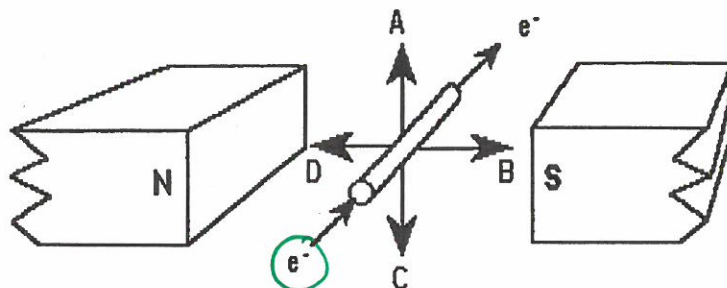


lines closest together

At which point is the magnetic field strength greatest?

- A) D B) A C) B **D) C**

- 3) A wire carrying an electron current (e^-) is placed between the poles of a magnet, as shown in the diagram below.



Left Hand

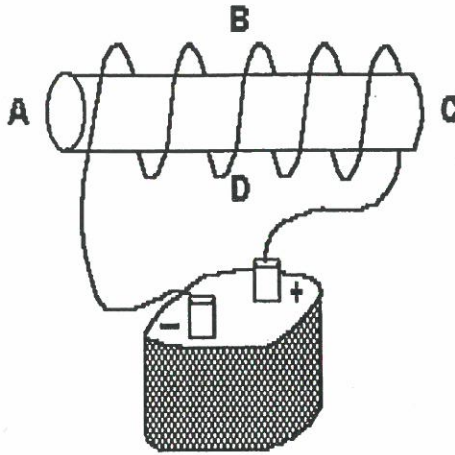
*fingers: right
thumb: back
palm: up*

Which arrow represents the direction of the magnetic force on the current?

- A) C B) D **C) A** D) B

The diagram below shows a coil of wire connected to a battery.

*Right hand rule → fingers curl w/ wires
thumb is N pole*



The N-pole of this coil is closest to

- A) D **B) C** C) A D) B

Electrons are flowing in a conductor as shown in the diagram below.

Left Hand



*fingertips = out
Awkward thumbs up*

What is the direction of the magnetic field at point P?

- A) out of the page** C) toward the bottom of the page
B) toward the top of the page D) into the page

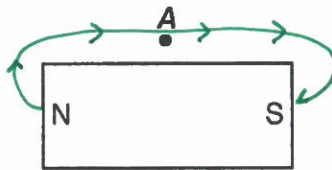
An electron moving in a uniform magnetic field experiences the maximum magnetic force when the angle between the direction of the electron's motion and the direction of the magnetic field is

- A) 0° B) 45° **C) 90°** D) 180°

An accelerating particle that does not generate electromagnetic waves could be

- A) a proton **B) a neutron no charge** C) an alpha particle D) an electron

The diagram below shows a bar magnet.

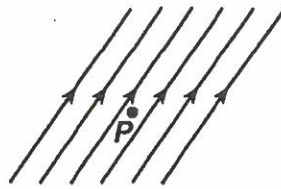


*out of N
into S*

Which arrow best represents the direction of the needle of a compass placed at point A?

- A) ↓ **B) →** C) ← D) ↑

The diagram below represents the magnetic field near point P.



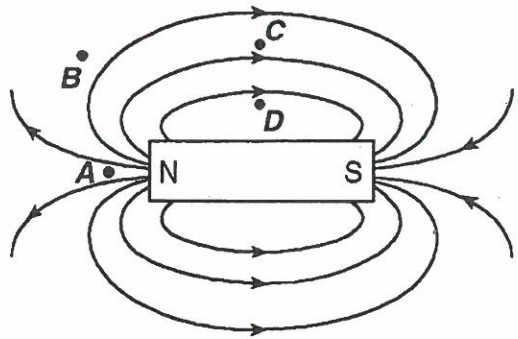
If a compass is placed at point P in the same plane as the magnetic field, which arrow represents the direction the north end of the compass needle will point?

- A) *along field lines*
- B)
- C)
- D)

10) Which diagram below best represents the magnetic field near a bar magnet?

- A)
 - B)
 - C)
 - D)
- out of N into S*

11) The diagram below represents the magnetic lines of force around a bar magnet.



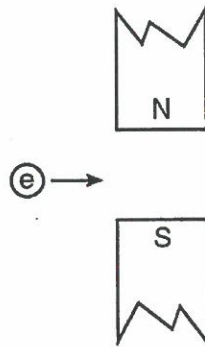
closest together

At which point is the magnitude of the magnetic field strength of the bar magnet the greatest?

- A) A
- B) B
- C) C
- D) D

The diagram below shows an electron about to enter the region between the poles of two magnets.

left hand



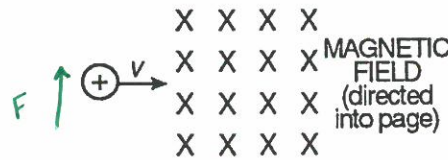
*fingers down
thumb right
palm out of page*

Upon entering the region between the poles, the moving electron will experience a magnetic force directed

- A) into the page
- B) out of the page
- C) toward the north pole
- D) toward the south pole

The diagram below shows a proton moving with velocity v about to enter a uniform magnetic field directed into the page. As the proton moves in the magnetic field, the magnitude of the magnetic force on the proton is F .

Right hand



If the proton were replaced by an alpha particle under the same conditions, what would be the magnitude of the magnetic force on the alpha particle?

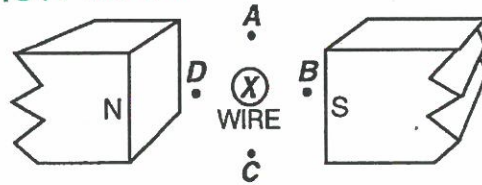
$q = +2e$

$F = qvB$

- A) $2F$
- B) $\frac{F}{2}$
- C) F
- D) $4F$

In the diagram below, a wire carrying an electron current into the page, as denoted by X, is placed in a magnetic field.

left hand



*fingers right
thumb in
palm up*

The magnetic field exerts a force on the wire toward point

- A) A
- B) B
- C) C
- D) D

A wire conductor is moved at constant speed perpendicularly to a uniform magnetic field. If the strength of the magnetic field is increased, the induced potential across the ends of the conductor

- A) increases
- B) remains the same
- C) decreases

$\mathcal{E} = Blv$ $\uparrow B \uparrow \mathcal{E}$

