Magnetism: Review

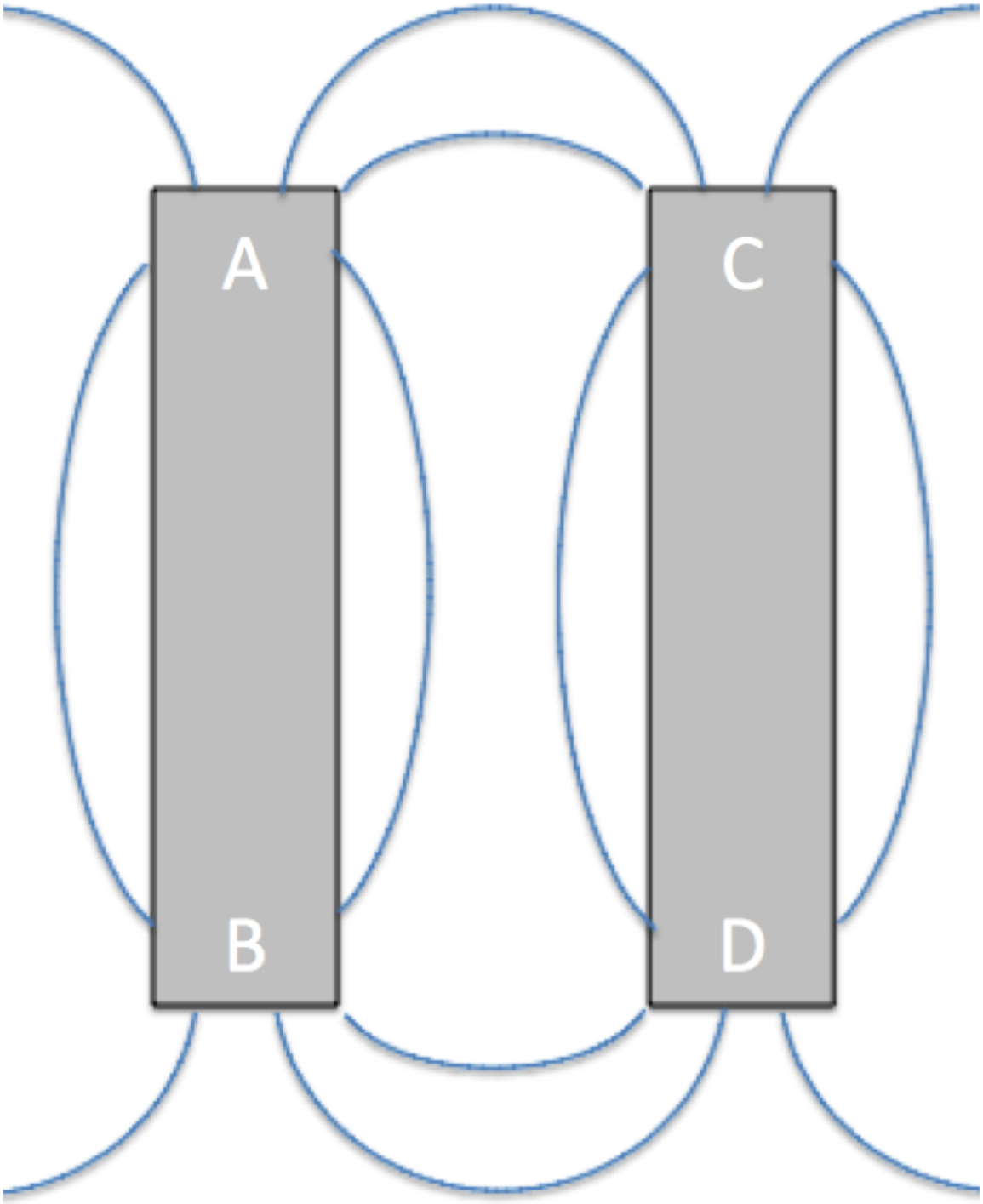
This is a preview of the draft version of the quiz

Started: Nov 20 at 2:05pm

Quiz Instructions

Question 1 — 1 pts

Below is a diagram of two bar magnets. Lines have been drawn it to represent the pattern that iron filings made when sprinkled over the tops of the magnets.

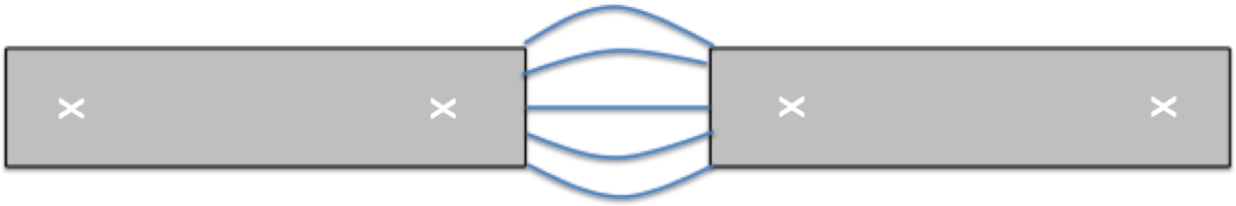


If Pole A is a north pole, then B is _____ and C is _____.

- north pole, north pole
- south pole, north pole
- south pole, south pole
- north pole, south pole

Question 2

1 pts

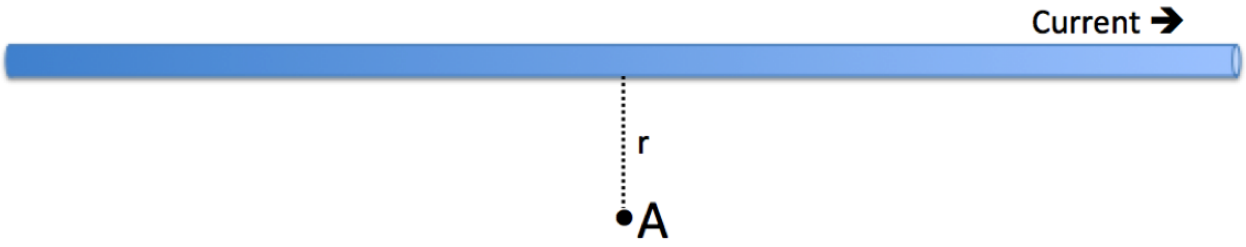


The magnets have been rearranged and a new sketch has been made of the magnetic field lines. Which of the following arrangement of the magnets could produce this field?

- AB-CD
- BA-DC
- BA-CD
- None of these

Question 3

1 pts

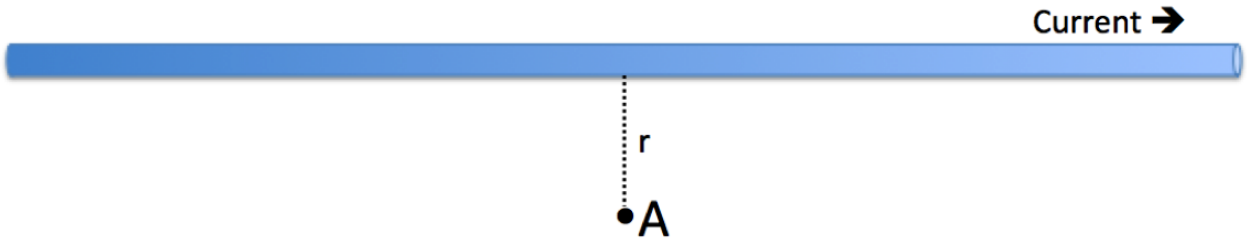


What is the direction of the magnetic field at point A?

- into the screen
- to the top of the screen
- out of the screen
- to the bottom of the screen

Question 4

1 pts



If the current through the wire is I, what is the strength of the magnetic field at point A?

- 4 x 10^-7 I/r
- 9 x 10^-7 I/r
- 8 x 10^-7 I/r
- 2 x 10^-7 I/r

Question 5

1 pts

A magnetic field of 0.2 T forces a beam of protons of 1.3 mA into a circular path with a radius of 0.12 m. The plane of the circle is perpendicular to the magnetic field. What is the approximate speed of a proton in the beam as it moves along the circular path?

- 0.3 x 10^6 m/s
- 2.1 x 10^6 m/s
- 2.3 x 10^6 m/s
- 4.6 x 10^6 m/s

Question 6

1 pts

A magnetic field of 0.2 T forces a beam of protons of 1.3 mA into a circular path with a radius of 0.12 m. The plane of the circle is perpendicular to the magnetic field.

For the magnetic field described above, if the magnetic field is oriented out of the screen and the circular path in the plane of the screen, which direction are the protons moving?

- counterclockwise
- into the screen
- out of the screen
- clockwise

Question 7

1 pts

A long, thin wire carries a current of 1.0 A. What is the strength of the magnetic field at a point 0.5 m from the wire?

- 8 x 10^-7 T
- 4 x 10^-7 T
- 2 x 10^-7 T
- 1 x 10^-7 T

Question 8

1 pts

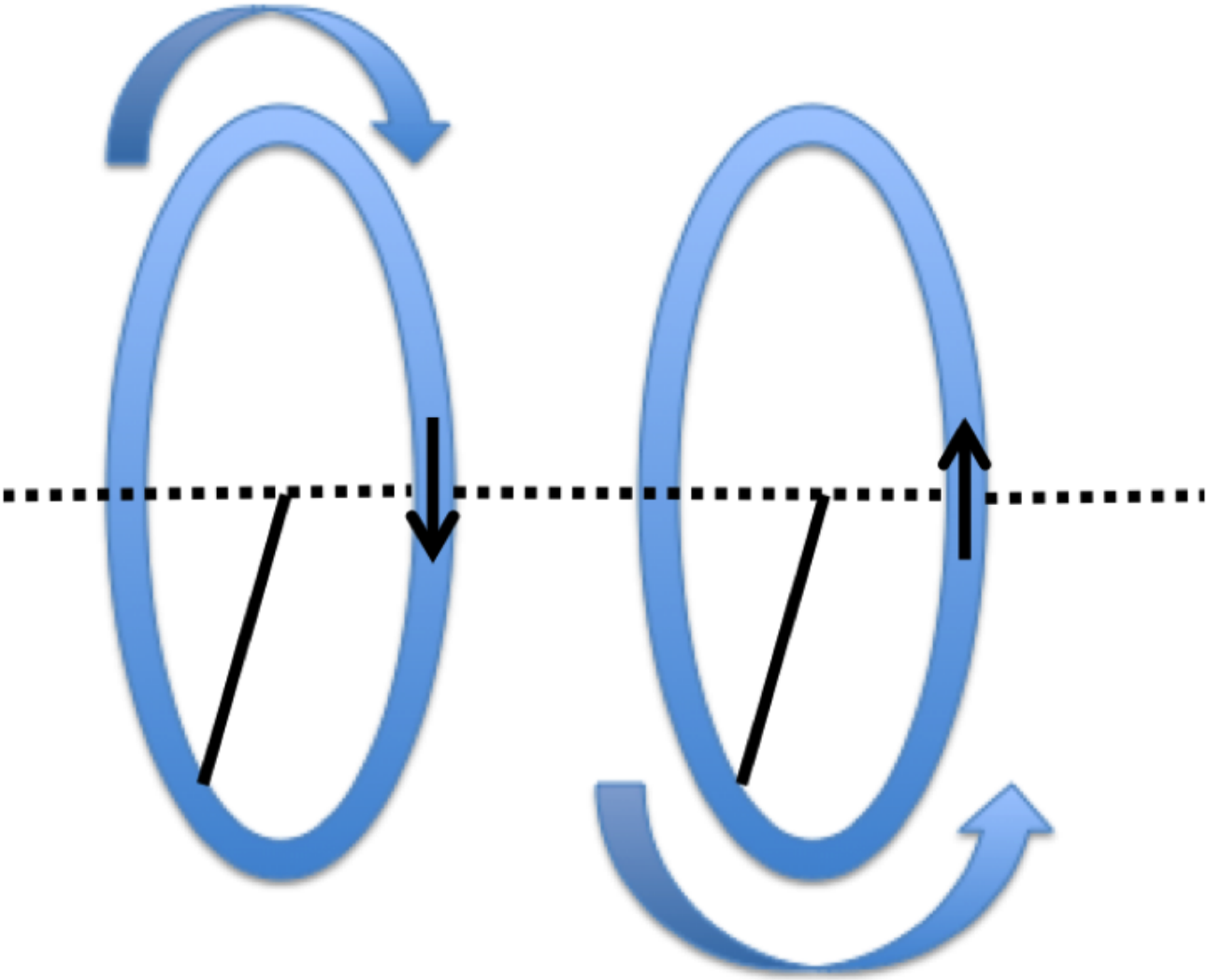
Consider a proton moving in an electric field 'E' with velocity 'v' and let the charge of a proton be represented by 'e'. What strength magnetic field would allow the proton to move at a constant speed, undeflected?

- ev
- Ev
- ev/E

- E/v

Question 9

1 pts



Two conducting loops of equal size and radius carry equal currents but in opposite directions. The loops are arranged parallel to each other and are centered on the same axis. What direction is the magnetic field at a point in the center of the loop on the right?

- to the left
- to the right
- into the screen

- out of the screen

Question 10

1 pts

Two long wires are fixed so that they run parallel and cannot move from their positions. They both carry an equal amount of current in the same direction. Which of the following is true about a point between the wires that is exactly the same distance from each wire?

- The force between the wires is repulsive and the magnetic field is zero.
- The force between the wires is attractive and the magnetic field is into the screen.
- The force between the wires is attractive and the magnetic field is zero.
- The force between the wires is repulsive and the magnetic field is into the screen.

Question 11

1 pts

What is magnetic flux?

- how quickly an oscillating magnetic field changes strength
- the rate of change in a magnetic field
- the amount of magnetic field that changes as an object moves through a field
- the amount of magnetic field passing through a surface

Question 12

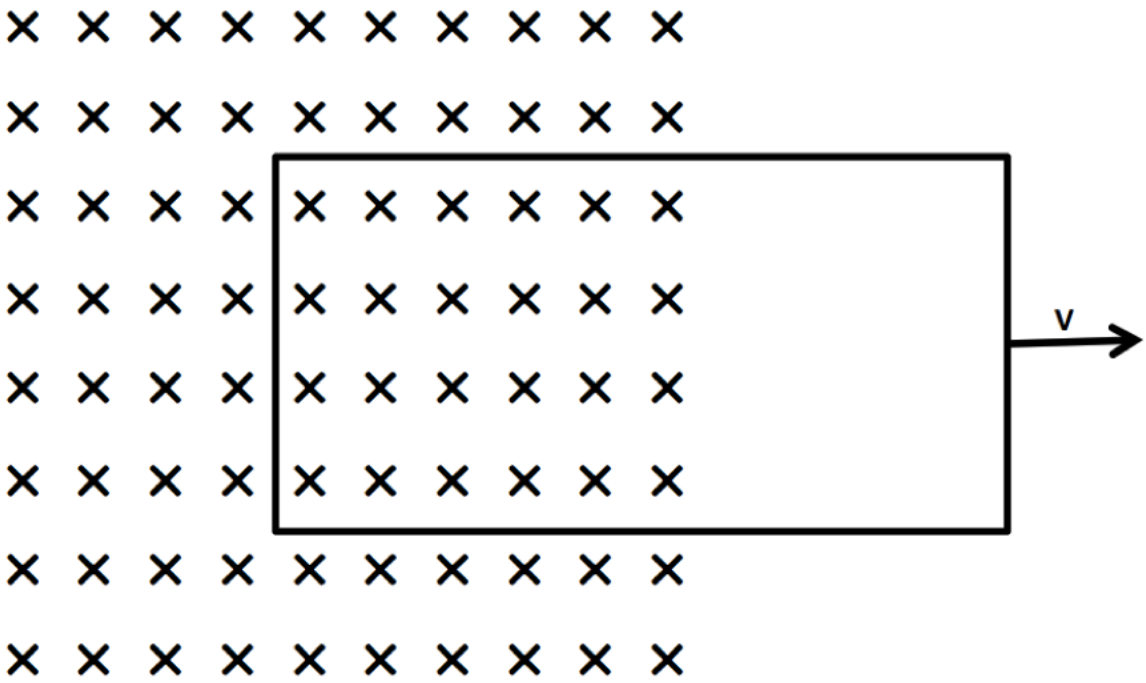
1 pts

A 0.25 m long copper rod has a constant velociy of 0.40 m/s traveling through a uniform magnetic field. of 0.050 T. The motion of the rod, the copper rod and the magnetic field are all perpendiculart to each other. What is the potential difference induced across the length of the rod?

- 0.015 V
- 0.020 V
- 0.010 V
- 0.005 V

Question 13

1 pts

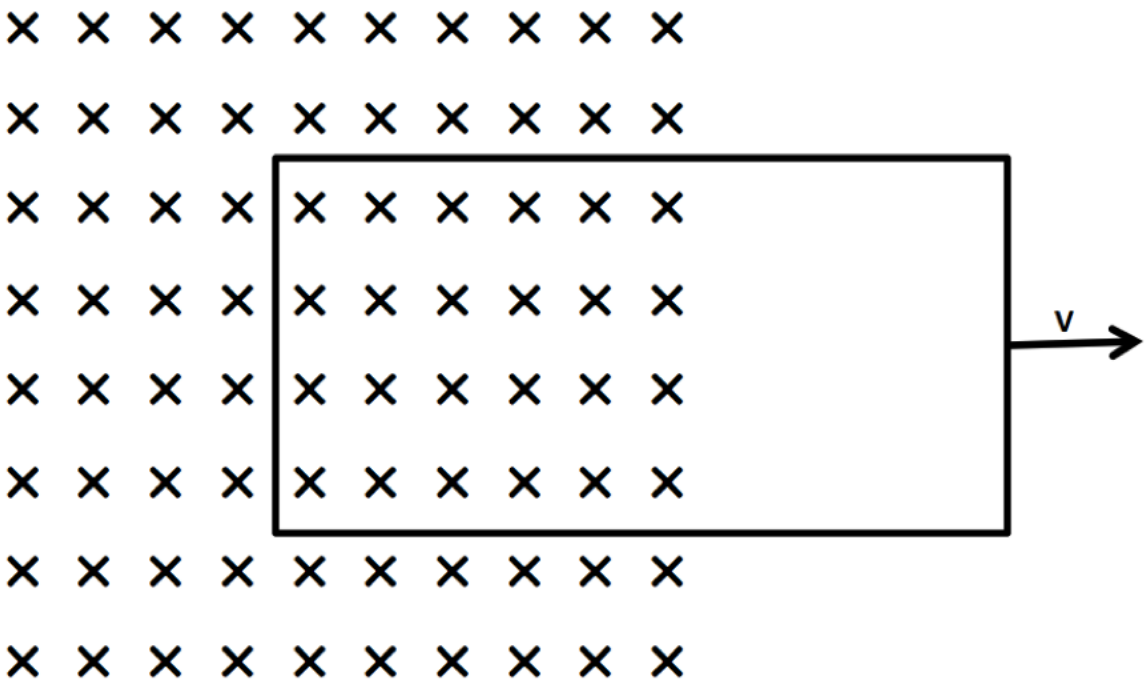


Consider the loop of wire in the magnetic field above. As the loop of wire moves out of the magnetic field as a constant speed, which of the following is true about the current in the loop?

- The current decreases as the loop leaves the magnetic field.
- There is no current.
- The current increases as the loop leaves the magnetic field.
- The current flows in the clock-wise direction

Question 14

1 pts

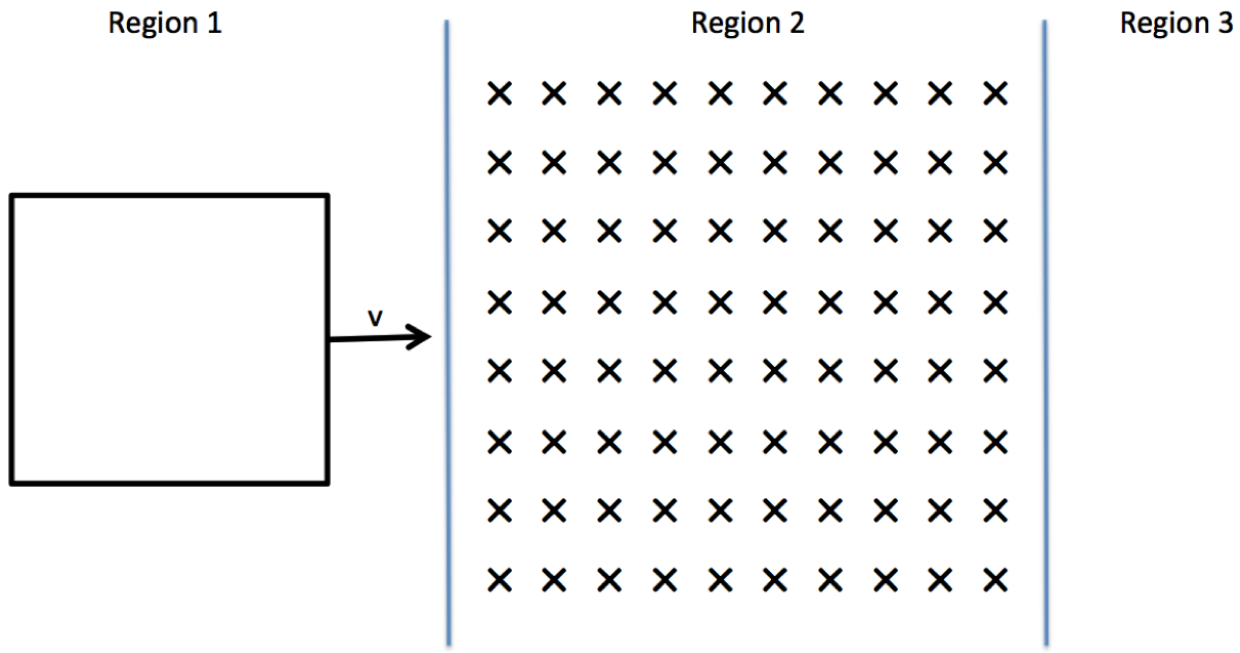


If the loop of wire has sides of lengths 'l' and 'm', 'l' being the shorter side and a resistance 'R', what is the current in the wire induced by its motion in the magnetic field B?

- Blv/R
- Blv
- Bmv
- Bmv/R

Question 15

1 pts



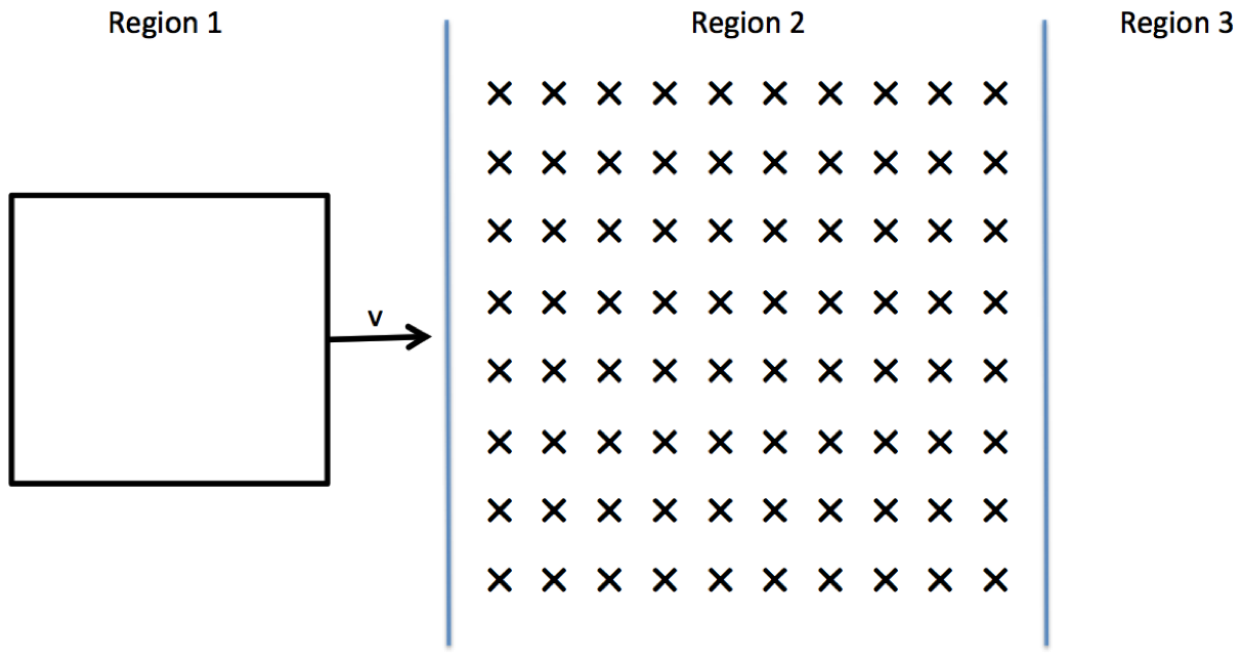
Consider a rigid, square-shaped loop of copper wire with sides of length 0.05m and resistance 0.03 ohms and a magnetic field of 0.10 T. The loop of wire moves across all 3 regions at a constant velocity of 0.15 m/s.

What is the flux in the loop when it is entirely in Region 2?

- 2.5 x 10^-4 Tm^2
- 5.0 x 10^-4 Tm^2
- 2.5 x 10^-5 Tm^2
- 5.0 x 10^-5 Tm^2

Question 16

1 pts



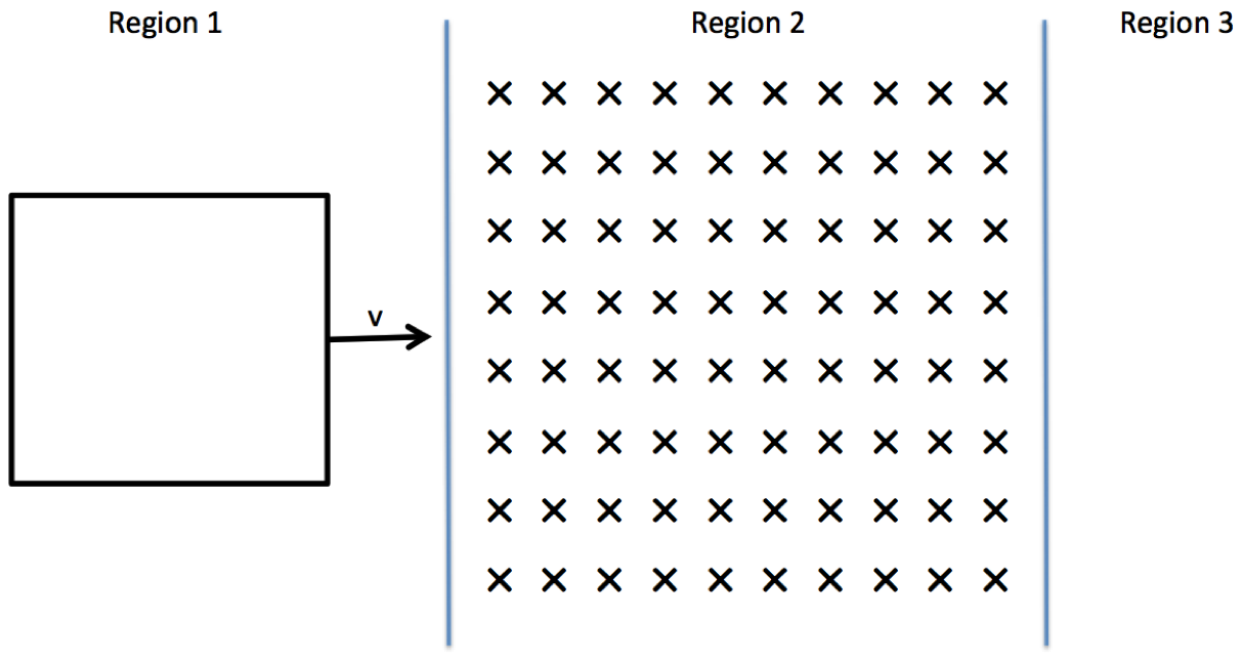
Consider a rigid, square-shaped loop of copper wire with sides of length 0.05m and resistance 0.03 ohms and a magnetic field of 0.10 T. The loop of wire moves across all 3 regions at a constant velocity of 0.15 m/s.

Which statement is true when the loop of wire moves from Region 1 into Region 2?

- The current in the wire is zero.
- The induced current is less than it will be when the loop is entirely in Region 2.
- The induced current is greater than the current is while the loop moves from Region 2 to 3.
- The induced current will flow counter-clockwise.

Question 17

1 pts



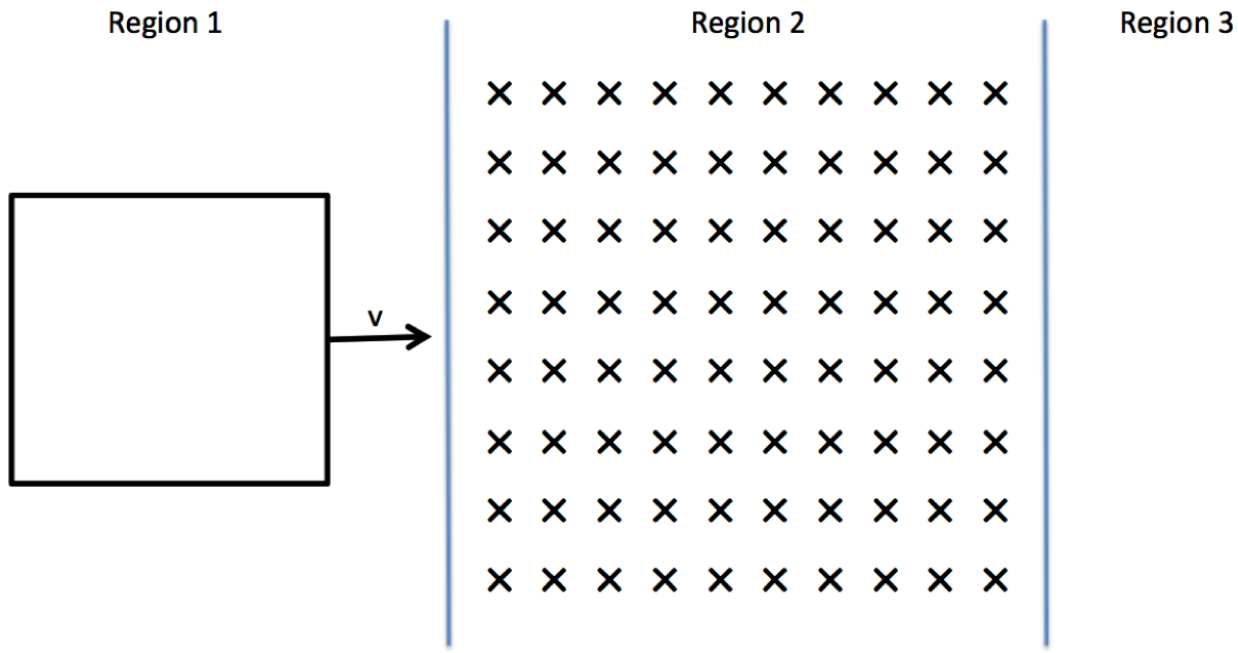
Consider a rigid, square-shaped loop of copper wire with sides of length 0.05m and resistance 0.03 ohms and a magnetic field of 0.10 T. The loop of wire moves across all 3 regions at a constant velocity of 0.15 m/s.

What is the current in the loop while it is entirely in Region 2?

- 0.48 A
- 0.023 A
- 1.2 A
- 0 A

Question 18

1 pts



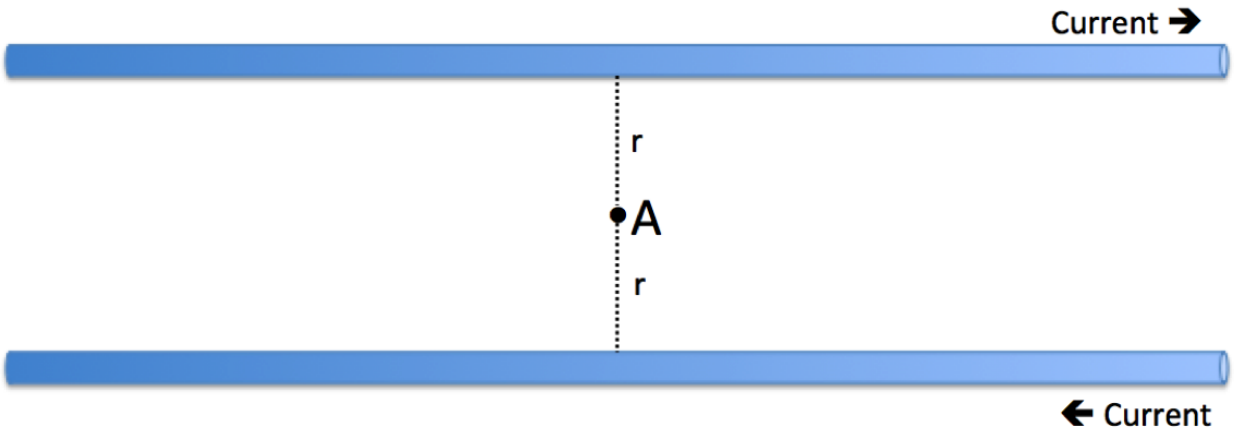
Consider a rigid, square-shaped loop of copper wire with sides of length 0.05m and resistance 0.03 ohms and a magnetic field of 0.10 T. The loop of wire moves across all 3 regions at a constant velocity of 0.15 m/s.

What is the current in the loop when it moves from Region 2 to Region 3?

- 0.050 A
- 0.025 A
- 0.0075 A
- 0.0090 A

Question 19

1 pts

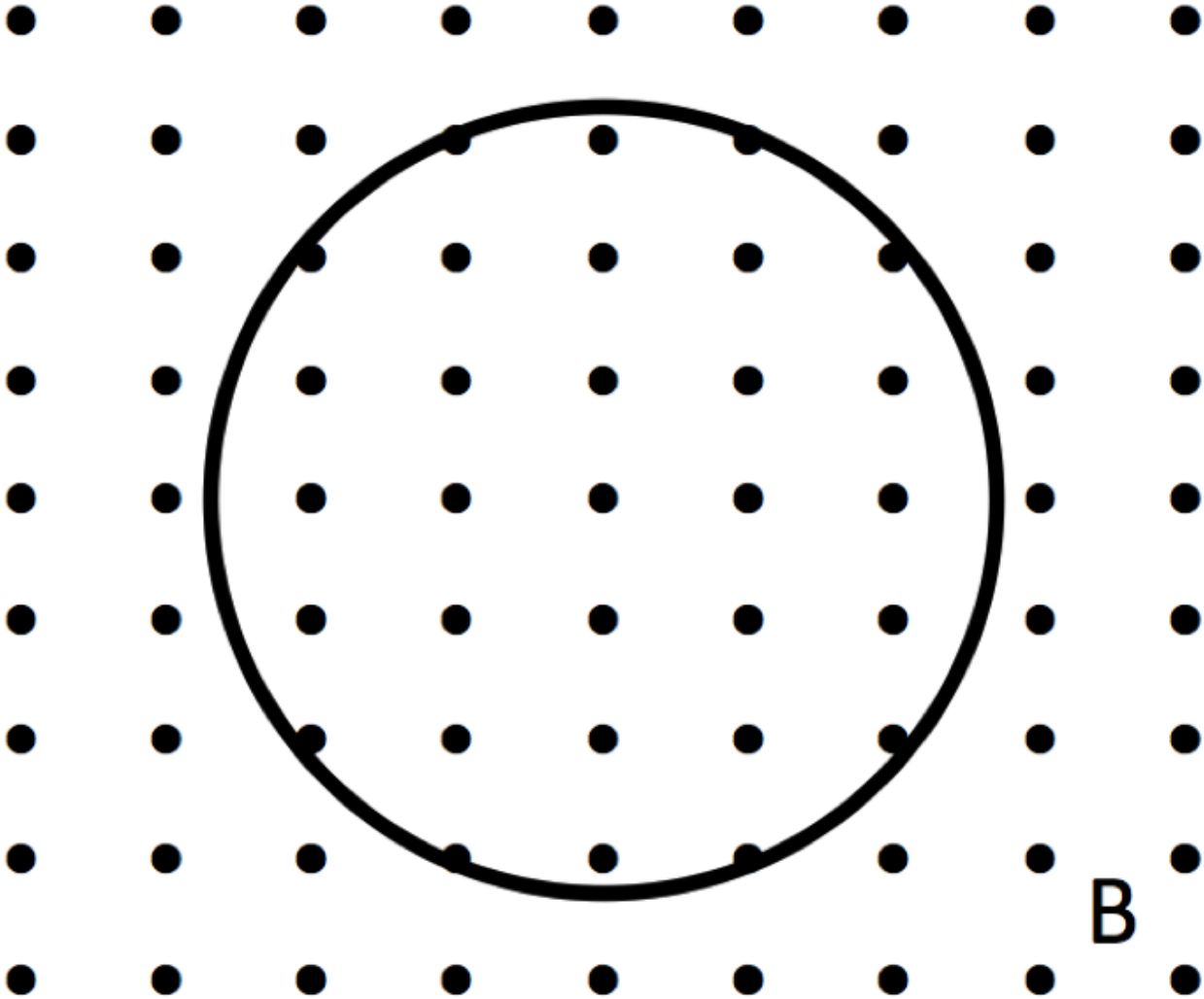


If the current through the wire on top is 0.15 A and the current through the wire on bottom is 0.2 A, what is the strength of the magnetic field at point A where r is 0.12 m?

- 2.5 x 10^-7 T
- 5.8 x 10^-7 T
- 3.3 x 10^-7 T
- 0.8 x 10^-7 T

Question 20

1 pts



Consider a loop of wire with an area of 0.50 m^2 in a magnetic field that begins with a strength of 4.0 T as pictured above. The magnetic field is decreasing in strength at a rate of 0.5 T/s. What is the induced EMF in the loop of wire?

- 0.25 V
- 0 V
- 2.0 V
- 4.0 V

Quiz saved at 2:05pm Submit Quiz