

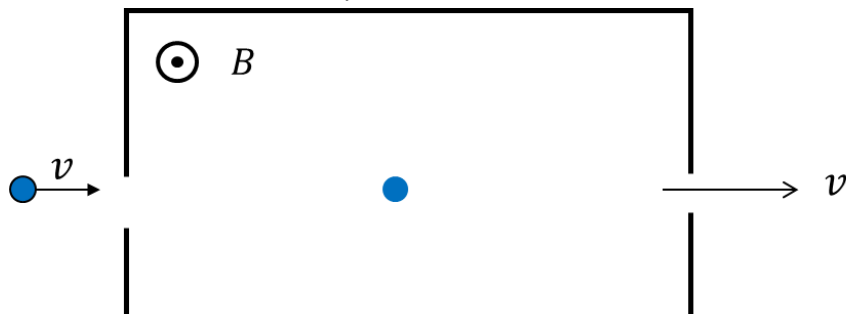
Name: _____ DISC: _____ Score: _____ / 20

Instructions:

- Do your own work.
- Answer the questions below in the space provided.
- Make sure you show all your work and any equations that you use.
- Please place a box around your answers.
- Remember to give the correct units with all numerical answers

Q1	Q2	Q3	Q4
5	10	5	5

1. Consider the velocity selector below where B is directed out of the page:



FORCE	$F = qvB \sin \theta$
	$F = qE$
	$F = IBL \sin \theta$
TORQUE	$\tau = FR \sin \theta$
	$\tau = IAB \sin \theta$
RADIUS OF CURVATURE	$R = \frac{mv}{qB}$

Useful Information for All Problems

CHARGE (q)	$-6\mu\text{C}$
MAGNETIC FIELD (B)	0.04 T
VELOCITY	$3 \times 10^5\text{ m/s}$

Information for Problem 1

Force (2 pt):

- a. On the diagram draw the direction in which the force from the magnetic field is pushing the particle when it moves into the box. Use the information in the table to help you.

Field (2 pt):

- b. On the diagram, draw the direction of the Electric Field required for the particle to travel straight through to the other side. Use the information in the table to help you.

Force (2 pt):

- c. Using the information in the table what is the magnitude of the force the particle experiences from the magnetic field B ?

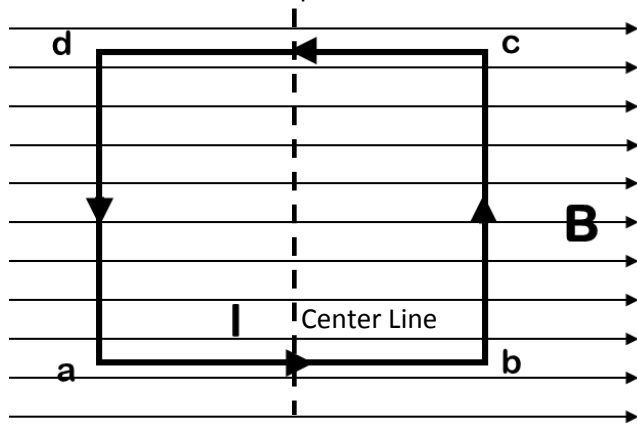
E-Field (2 pt):

- d. What is the magnitude of the electric field needed to keep the particle going in a straight line?

E-Field (2 pt):

- e. If the electric field is removed, the particle travels a circular path of radius $R = 0.2\text{ m}$. What is the particle mass?

2. Consider the current loop shown below:



I	$8\mu A$
B	4 mT
L	0.25 m
Useful Information	

Fill in the following table:

WIRE SEGMENT	FORCE	DIRECTION (choose one)	TORQUE ON LOOP
ab		Into page Out of page Neither	
bc		Into page Out of page Neither	
cd		Into page Out of page Neither	
da		Into page Out of page Neither	

Table (10 pts):
1 pt for each force
1pt for each direction
2 pts for the torque

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