

Read 14.4

Exam next Wednesday

Chp 12, 13, 14

same format as exams 1, 2

multiple choice

1 sheet of paper...

Exam prep on class web page

old Exam

solutions

I will be out of town

Leaving Friday after class

return Tuesday evening

Guest Lecturer Monday

my office hours cancelled Monday

1:30 - 2:30 today

2:45 - 3:45 tomorrow office hours

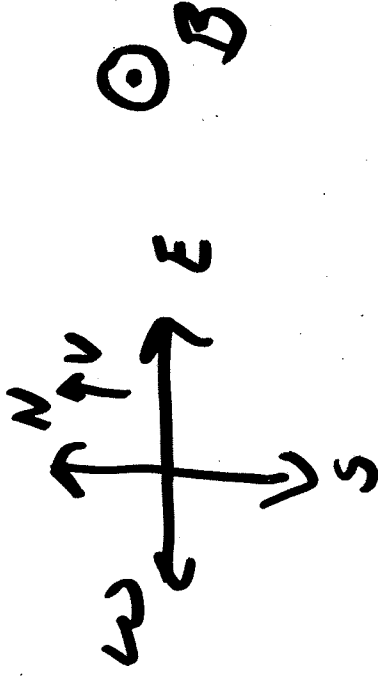
Problem: A proton moves at a speed of $8.0 \times 10^6 \text{ m/s}$ directly north in a magnetic field of magnitude 2.5 T directed straight up. At that moment what is the magnitude and direction of the force the proton feels?

$$B = 2.5 \text{ T}$$

$$v_1 = 8 \times 10^6 \text{ m/s}$$

$$q = +1.6 \times 10^{-19} \text{ C}$$

want $\vec{F}$



$$F = q v_{\perp} B = (1.6 \times 10^{-19} \text{ C})(8 \times 10^6 \text{ m/s})(2.5 \text{ T})$$

$$= \underline{\underline{3.2 \times 10^{-12} \text{ N}}}$$

East

Problem: An electron moving directly north at a speed of 1.5×10^7 m/s and feels a force straight down with a magnitude of 2.2×10^{-12} N. If the electron is traveling at a right angle to the magnetic field, what is the magnitude and direction of the magnetic field?

$$F = 2.2 \times 10^{-12} \text{ N}$$

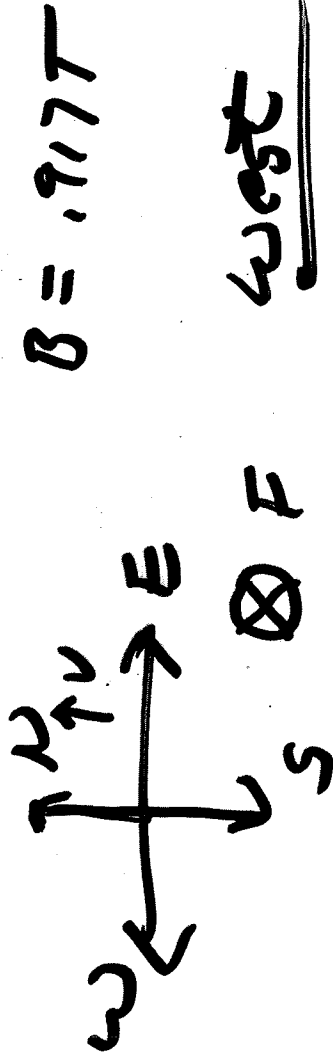
west B

$$v_{\perp} = 1.5 \times 10^7 \text{ m/s}$$

$$q = -1.6 \times 10^{-19} \text{ C}$$

$$F = q v_{\perp} B \Rightarrow B = \frac{F}{q v_{\perp}} = \frac{2.2 \times 10^{-12} \text{ N}}{(1.6 \times 10^{-19} \text{ C})(1.5 \times 10^7 \text{ m/s})}$$

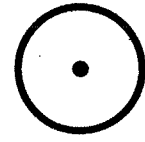
$$B = .917 \text{ T}$$



Interactive Question

A proton enters a region that contains a uniform magnetic field directed into the paper as shown.

What is the direction of the magnetic force on the proton when it enters the field



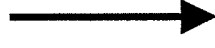
(A)



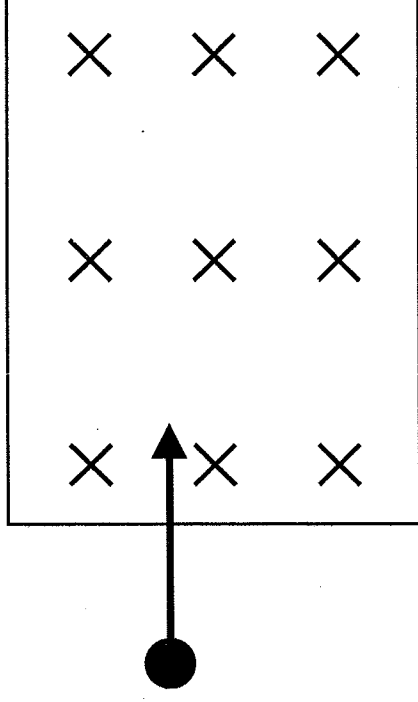
(B)



(C)



(D)



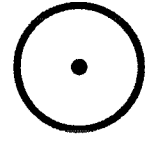
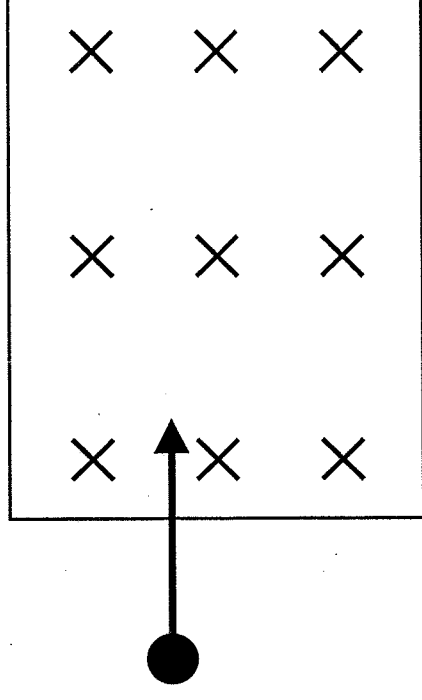
E) None of the above

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Interactive Question

An electron enters a region that contains a uniform magnetic field directed into the paper as shown.

What is the direction of the magnetic force on the proton when it enters the field



(A)



(B)



(C)



(D)

E) None of the above

(D)