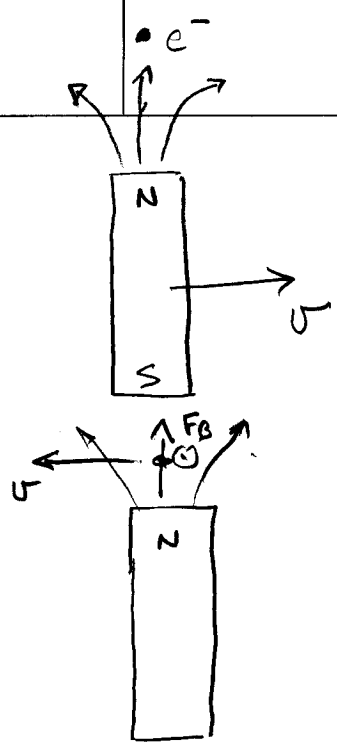
26-11 GIVEN:



IS THERE A FORCE ON THE ELECTRON?

YES, THERE IS A FORCE

THE MAGNET MOVING RIGHT BY A STATIONARY ELECTRON

IS EQUIVALENT TO

AN ELECTRON MOVING LEFT PAST A STATIONARY MAGNET

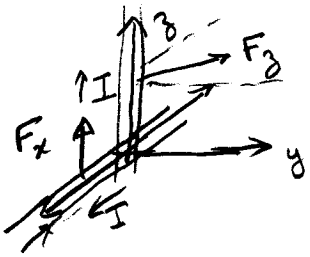
USING THE RHR, THE FORCE IS $\boxed{\text{OUT OF THE PAGE}}$ WITH MAGNITUDE $F_B = qvB$ AT THE INSTANT SHOWN

26-24 GIVEN: $l = 10\,cm$ $\quad F_y = -.20\,N\,\hat{i} + .20\,N\,\hat{j}$ WITH WIRE/CURRENT +Z-AXIS

$I = 4.0\,A$

$Il = (4.0\,A)(.1\,m) = .4\,Am$ $\quad F_x = .20\,N\,\hat{k}$ WITH WIRE/CURRENT +x-AXIS

FIND: $\vec{B}$



+y AXIS WIRE:

$$\begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 0 & 0 & .4\,Am \\ B_x & B_y & B_z \end{vmatrix} = -.20\,N\,\hat{i} + .2\,N\,\hat{j}$$

$-.4\,A\cdot m\,B_y = -.20\,N \Rightarrow B_y = .5\,T$

$.4\,Am\,B_x = +.20\,N \Rightarrow B_x = .5\,T$

x AXIS WIRE:

$$\begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ .4\,Am & 0 & 0 \\ B_x & B_y & B_z \end{vmatrix} = .2\,N\,\hat{k}$$

$-.4\,A\cdot m\,B_z = 0 \Rightarrow B_z = 0$

$.4\,A\cdot m\,B_y = .2\,N \Rightarrow B_y = .5\,T$

$\therefore \boxed{\vec{B} = .5\,T\,\hat{i} + .5\,T\,\hat{j}}$