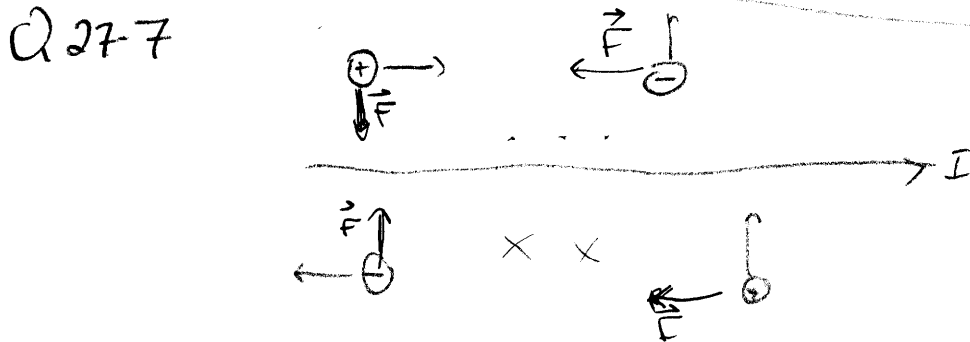


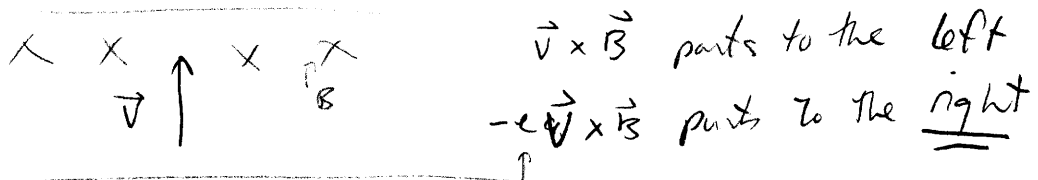
Homework 9

Q 27-4 $F = I \vec{l} \times \vec{B}$ \vec{l}, \vec{B} any angles
 always 90°

Q 27-6 No work done by B-fields, so kinetic Energy can't change.



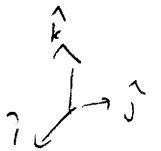
Q 27-15



P 27-25

$$\vec{B} = (0.45\hat{i} + 0.38\hat{j})\text{T} \quad \vec{E} = (3.0\hat{i} - 4.2\hat{j}) \times 10^3 \text{V/m}$$

$$\vec{v} = (6.0\hat{i} + 3.0\hat{j} - 5.0\hat{k}) \times 10^3 \text{m/s}$$



$$\vec{F} = q\vec{v} \times \vec{B} + q\vec{E} \quad q = -e \quad \hat{i} \times \hat{i} = \hat{j} \times \hat{j} = \hat{k} \times \hat{k} = 0$$

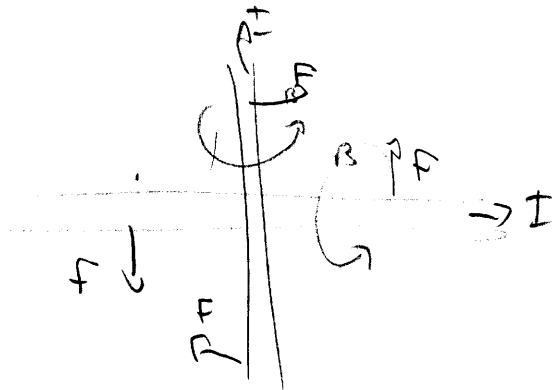
$$= -e \left[(6\hat{i} + 3\hat{j} - 5\hat{k}) \times (0.45\hat{i} + 0.38\hat{j}) + (3\hat{i} - 4.2\hat{j}) \right] \text{ [units]}$$

$$= -e \left[6(0.38)\hat{i} \times \hat{j} + 3(0.45)\hat{j} \times \hat{i} - 5(0.45)\hat{k} \times \hat{i} - (5 \cdot 0.38)\hat{i} \times \hat{j} + 3\hat{i} - 4.2\hat{j} \right]$$

$$= -e \left[2.28\hat{k} - 1.35\hat{k} - 2.25\hat{j} + 1.9\hat{i} + 3\hat{i} - 4.2\hat{j} \right]$$

$$= \left[0.78\hat{i} - 1.0\hat{j} + 15\hat{k} \right] \times 10^{-15} \text{N}$$

Q 28-3



Net force is zero

net torque \neq zero

P 28-1

$$B = \frac{\mu_0 I}{2\pi r} = \frac{(4\pi \times 10^{-7})(65 \text{ A})}{2\pi (0.035 \text{ m})} = 3.7 \times 10^{-4} \text{ T}$$

earth's field $5 \times 10^{-5} \text{ T}$ is an order of magnitude weaker!