Given: An external magnetic field $\vec{B}$ which is downward $\downarrow$, $(-\hat{j})$. A current $I$ which flows out of the page $\circlearrowleft$, ($\hat{k}$).

Determine the direction of the force.

A) The direction of force is $+\hat{i}$.
B) The direction of force is $-\hat{i}$.
C) The direction of force is $+\hat{j}$.
D) The direction of force is $-\hat{j}$.

Here we want to determine the direction of cross-product $\Delta \vec{F} = I\Delta \ell \times \vec{B}$. From the directions given, we have $(\hat{k}) \times (-\hat{j}) = \hat{i}$.

Answer A.

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