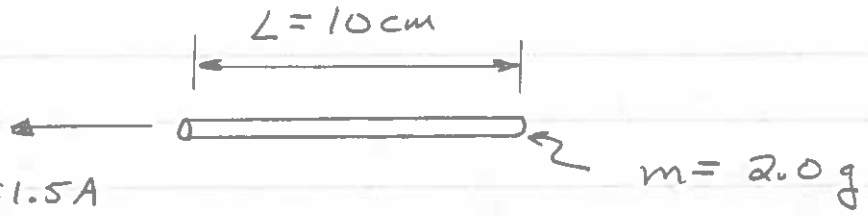
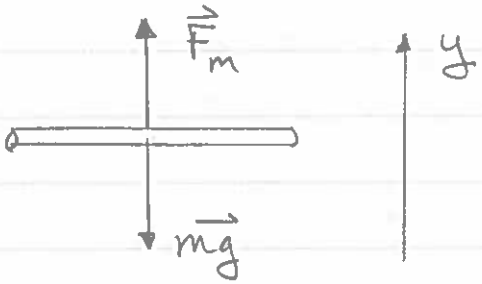


FBD



$$\Sigma F_y = F_m - mg \Rightarrow F_m = mg$$

Now, $\vec{F}_m = I\vec{L} \times \vec{B} = (ILB, \text{up})$

RHR $\Rightarrow \vec{B} = (B, \text{out})$

So, $F_m = mg = ILB$

$$B = \frac{mg}{IL} = 0.131\ T$$

∴ $\vec{B} = 0.131\ T, \text{out}$