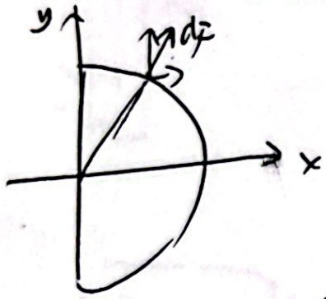
作业纸

课程名称：大物

班级：63012216 教学班级：08012204 姓名：俞乐桐 学号：1120224303 第 1. 页

第三章

3-17. $B=\frac{\mu_0 I_1}{2\pi R\sin\theta}$ 向内.



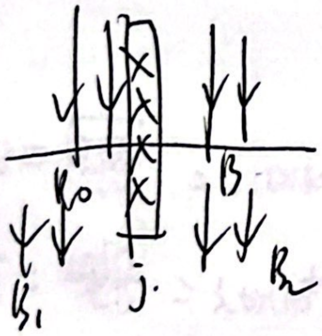
$dF = I_2\, dl\, B$.

$=\frac{\mu_0 I_1 I_2}{2\pi R\sin\theta} R\,d\theta$.

$dF_x = \frac{\mu_0 I_1 I_2}{2\pi}\pi = \frac{\mu_0 I_1 I_2}{2}$.

$\therefore F = \frac{1}{2}\mu_0 I_1 I_2$

3-19.

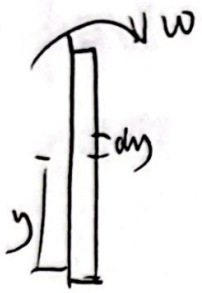


$B_左 = B_右 = \frac{\mu_0}{2} j$.

$\begin{cases} B_0 - B_左 = B_1 \\ B_0 + B_右 = B_2 \end{cases}$ $B_0 = \frac{B_1+B_2}{2}$. $j = \frac{B_2-B_1}{\mu_0}$.

$\vec{F} = \vec{j}\times\vec{B_0}$. $F = jB_0 = \frac{(B_2^2-B_1^2)}{2\mu_0}$.

3-21.

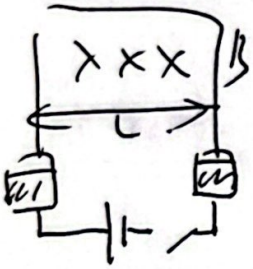


$dI = dq\frac{w}{2\pi} = \frac{Qw}{2\pi L}dy$

$dm = \pi y^2 dI = \frac{Qw}{2L}y^2 dy$

$m = \int dm = \int_0^l dm = \frac{1}{6}Qwl^2$

3-23



$\int F dt = BLq = mv$

$\therefore v = \frac{BLq}{m}$

$E_K = \frac{B^2L^2q^2}{2m}$

$q = \frac{m}{BL}\sqrt{2gh}$

3-25 $v = \sqrt{\frac{2E_K}{m}} = 2.6\times10^7\ m/s$

$T = \frac{2\pi m}{eB} = 3.6\times10^{-9}\ s$

$h = v\cos 85^\circ T = 1.6\times10^{-4}\ m$

$r = \frac{mv\sin 85^\circ}{eB} = 1.5\times10^{-3}\ m$

3-28. $B = \frac{nqbU_H t}{I} = 0.1\ T$

联系方式:_____

3-29. $\oint H\,dl = \oint_L H dl = H\,2\pi r = \sum I_{0\text{内}Q}$

· $r<R_1$ 时 $H = \frac{r}{2\pi R_1^2} I$

$$B = \frac{\mu_1 r}{2\pi R_1^2} I$$

$R_1 < r < R_2$ 时. $H = \frac{I}{2\pi r}$

$$B = \mu_2 H = \frac{\mu_2 I}{2\pi r}$$

$r > R_2$ 时.

$$B = \mu_0 H = \frac{\mu_0 I}{2\pi r}.$$

3-30. $\oint H dl = H(ab)$

$$H(ab) = nI(ab)$$

$$H = nI$$

$$B = \mu_0 \mu_r H = \mu_0 \mu_r nI.$$

$$M = \frac{B}{\mu_0} - H = (\mu_r - 1)H.$$

$$j' = M = (\mu_r - 1)nI$$

$$\vec{j}' = \vec{n} \times \vec{e}_n$$