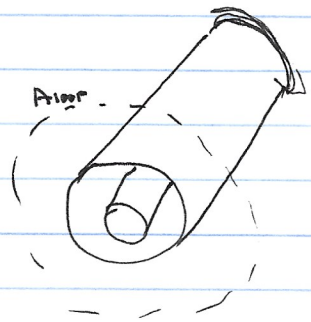
Phys Discussion 19

a.)



$\int B\,ds = \mu_0 I$

$\rightarrow B\,l = \mu_0 I$

$B_1 = \frac{\mu_0 I}{(r-R_2)(2\pi)}$ $\quad B_2 = \frac{-\mu I}{(r-R_1)(2\pi)}$

$\therefore B = \frac{\mu_0 I}{2\pi(r-R_2)} - \frac{\mu_0 I}{2\pi(r-R_2)}$ $\therefore$ ~~[illegible]~~ $B=0$ ~~Counter clockwise?~~

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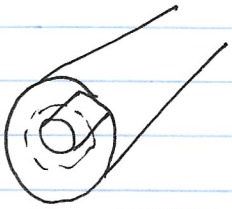
b.)

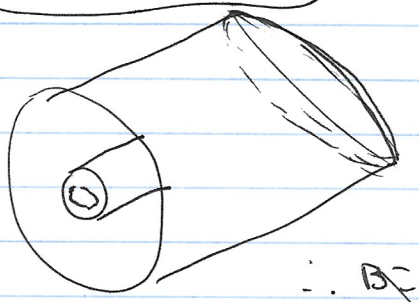


$Bl = \mu_0 I \rightarrow B = \frac{\mu_0 I}{2\pi(r)}$

clockwise

c.) $J = \frac{I}{A} = \frac{-I}{\pi R_1^2}$

d.)



$B = \frac{\mu_0 I_{enc}}{2\pi(r)^2}$

$I_{enc} = J \cdot \pi r^2 = \frac{-I}{\pi R_1^2} \cdot \pi r^2 = \frac{-I r^2}{2R_1}$

$I_{enc} = \frac{-I \pi r^2}{\pi R_1^2} = -I\frac{r^2}{R_1^2}$

$\therefore B = \frac{-\mu_0 \frac{I}{2R_1}}{\pi L} + \frac{-\mu_0 I}{2\pi R}$

$\therefore B = \frac{-\mu_0 A \frac{r^2}{R_1^2}}{2\pi r}$ $\therefore$ $B = -\frac{\mu_0 I}{\pi R_1^2}$

Clockwise

$B = \frac{-\mu_0 I_{enc}}{2\pi r} = -\frac{\mu_0 \frac{r^2}{R_1^2}}{2\pi r} = \frac{-\mu_0 r}{2\pi R_1^2}$