


作业纸

课程名称: 大物

班级:

教学班级: 08012204 姓名: 俞乐博

学号: 1120221303 第 1 页

解 1.  (1) $R = \frac{\rho L}{S} = 0.0295 \Omega$

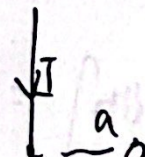
(2) $R = \rho \frac{L}{S}$
 $\therefore \rho = 1.84 \times 10^{-8} \Omega \cdot m$

(3) $J = \frac{I}{S} = 2.39 \times 10^5 A/m^2$

(4) $E = \rho J = 4.40 \times 10^{-3} V/m$

(5) $J = n e v$

$n = \frac{J}{e v} = 8.79 \times 10^{28} m^{-3}$

2. (1) $B = \frac{\mu_0 I}{4\pi a}$  垂直纸面向外

(2) $B = \frac{\mu_0 I}{2\pi r} + \frac{\mu_0 I}{4r}$ 垂直纸面向里

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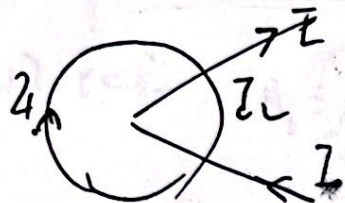
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64.

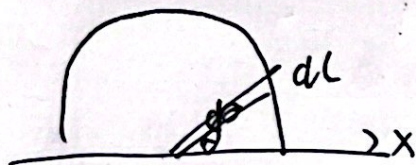


$$B_1 = \frac{\mu_0}{4\pi} \int_0^{2\pi} \frac{I dl}{r^2} = \frac{\mu_0 I l}{4\pi r^2}$$

$$B_2 = \frac{\mu_0 I l}{4\pi r^2}$$

$$\frac{I_1}{I_2} = \frac{R_2}{R_1} = \frac{l_2}{l_1} \quad \therefore B_1 = B_2 \text{ from the } \therefore B = 0$$

65.



$$d\vec{r} = \frac{I}{\pi R} d\vec{l} = \frac{I}{\pi} d\theta$$

$$dB = \frac{\mu_0 dI}{2\pi R} = \frac{\mu_0 I d\theta}{2\pi R}$$

$$B = \int dB \sin \theta = \int_0^\pi \frac{\mu_0 I}{2\pi R} \sin \theta d\theta = \frac{\mu_0 I}{\pi R}$$

$$9. dq = \sigma \theta dr$$

$$dI = \frac{dq}{T} = \frac{\omega \sigma \theta dr}{2\pi}$$

$$dB = \frac{\mu_0 dI}{2r}$$

$$B = \int_0^R dB = \frac{\mu_0 \omega \sigma R}{4\pi}$$

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10. $\oint B dl = \mu_0 \sum I_{in}$

(1). $r < R_1$. $B_1 = \frac{\mu_0 r}{2\pi R_1^2} I$

(2). $R_1 < r < R_2$. $\sum I_{in} = I$
 $B_2 = \frac{\mu_0 I}{2\pi r}$

(3). $R_2 < r < R_3$ $\sum I_{in} = \frac{R_3^2 - r^2}{R_3^2 - R_2^2} I$
 $B_3 = \frac{\mu_0 I}{2\pi r} \frac{R_3^2 - r^2}{R_3^2 - R_2^2}$

(4). $r > R_3$. $\sum I_{in} = I$
 $B_4 = 0$

11. $B = \frac{I}{\pi(R^2 - r^2)}$. $B = B_1 + B_2 = \frac{\mu_0 I r}{2\pi d(R^2 - r^2)}$
or $B = \frac{\mu_0}{2\pi d} \frac{\pi I d^2}{\pi(R^2 - r^2)} = \frac{\mu_0 I d}{2\pi(R^2 - r^2)}$

12. (1) $B = \frac{\mu_0 I}{2\pi d} = 4 \times 10^{-5} T$

(2) $\phi = \int B dS = \int_{r_1}^{r_2} \frac{\mu_0 I}{2\pi r} (dr = \frac{r_2}{r} - \frac{r_1}{r}) = 2.2 \times 10^{-6} Wb$

联系方式: _____