Chapter 32, 1, 45

1.

(a) $\phi_E = 3(mv \cdot m/s)t$

$B \cdot 2\pi r = \mu_0 \varepsilon_0 \pi r^2 \frac{dE}{dt}$

以入 $B = 6.64 \times 10^{-20} T$.

(b) $B \cdot 2\pi r = \mu_0 \varepsilon_0 \cdot \pi R^2 \frac{d}{dt}\left(\frac{3 \times 10^{-3}}{\pi R^2}\right) = 1.06 \times 10^{-19} T$

(c) $B = 1.33 \times 10^{-19} T$

$r = R = 4 cm$.

45 $i_d = \varepsilon_0 A \frac{dE}{dt}$

(a) $\vec{J} = \sigma \vec{E} \quad E = \rho J$

$J = \frac{i}{A} \quad E(t) = \rho \cdot \frac{i(t)}{A} = 0.175 \, v/m$

(b) $i_d = 2.87 \times 10^{-16} A$

(c) $\oint B \, ds = \mu_0 i_{enc} \qquad Bd = \frac{\mu_0 i_{enc}}{2\pi r}$

$\frac{Bd}{B} = 5.31 \times 10^{+8}$