Answers Exam 3 2012

1. a) $B_x = \dfrac{\mu_0 i H}{\pi (d^2 + H^2)}$

b) $\vec{B} = 0$

c) $\vec{B} = \dfrac{\mu_0 i \theta}{4\pi W} \odot$

2. a) assuming $d\vec{s}$ is $\odot$

$$\Phi = -B_0 H \left(\alpha W + \beta \frac{W^2}{2}\right)$$

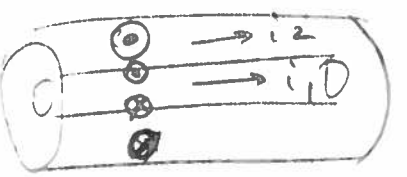
b) $R = \dfrac{\rho 2(H+W)}{a}$

c) $i = \dfrac{B_0 H W \beta v}{R}$ CCW

3. a) $L \dfrac{d^2Q}{dt^2} + R \dfrac{dQ}{dt} + \dfrac{1}{C} Q = B_0 \gamma W H$

b) $Q(t) = C B_0 \gamma W H \left(1 - e^{-\beta t}\right)$

4. a) $B = \dfrac{\mu_0 i}{2\pi a^2} r$



b) $B = \dfrac{\mu_0}{2\pi r}\left(i_1 + i_2 \dfrac{r^2 - a^2}{b^2 - a^2}\right)$

c) $R_1 = \dfrac{\rho_1 W}{\pi a^2}$ $R_2 = \dfrac{\rho_2 W}{\pi (b^2 - a^2)}$

$i_1 = \dfrac{V}{R_1}$; $i_2 = \dfrac{V}{R_2}$