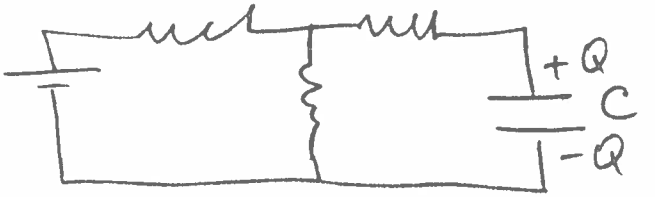
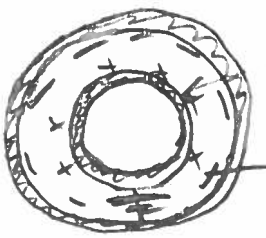
Exam 2 2012

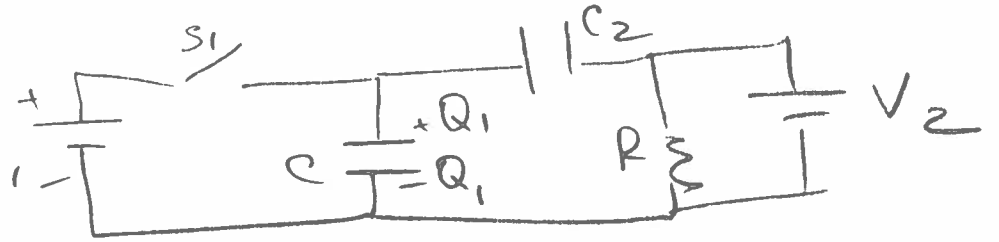
1. a) 

$$Q = \frac{V}{R_1 + R_3} R_3 C$$

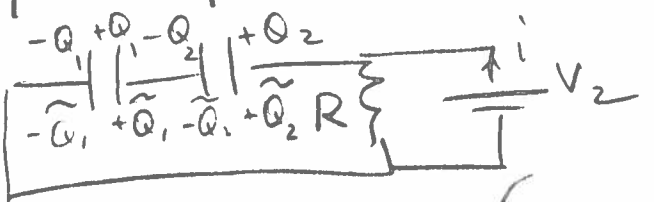
b) $$V = \frac{R_1 + R_3}{R_3} E_{max} \cdot d$$

2. a) 

b) $$Q = V \frac{4\pi\varepsilon_0}{\frac{1}{A+T} - \frac{1}{B}}$$

3. 

a) $Q_1 = C_1 V_1$

b) 

$$i = \frac{V_2}{R}; \quad \tilde{Q}_1 = \frac{\left(V_2 + \frac{Q_1}{C_2}\right) C_1 C_2}{C_1 + C_2}$$

$$\tilde{Q}_2 = \tilde{Q}_1 - Q_1$$

4. a) $\vec{E}(r_1) = \sigma_1 \frac{i}{2\pi r_1 W}$ radially out

b) $\vec{E}(r_2) = \sigma_2 \frac{i}{2\pi r_2 W}$ radially in

c) $V = i(R_1 + R_2) = \Delta V_1 + \Delta V_2$; $\Delta V_1 = \frac{Q_1 i}{2\pi W} \ln \frac{b}{a}$

$\Delta V_2 = \frac{Q_2 i}{2\pi W} \ln \frac{f}{b}$