P.5-6 $\rho_0 = \frac{Q_0}{(4\pi/3)b^3} = \frac{10^{-3}}{(4\pi/3)(0.1)^3} = 0.239\ (C/m^3)$, $\rho = \rho_0 e^{-(\sigma/\epsilon)t}$

a) $R < b$: $\bar{E}_i = \bar{a}_R \frac{(4\pi/3)R^3\rho}{4\pi\epsilon R^2} = \bar{a}_R \frac{\rho_0 R}{3\epsilon} e^{-(\sigma/\epsilon)t} = \bar{a}_R\, 7.5\times10^{9} R\, e^{-9.42\times10^{11}t}$ (V/m)

$R > b$: $\bar{E}_o = \bar{a}_R \frac{Q_0}{4\pi\epsilon_0 R^2} = \bar{a}_R \frac{q}{R^2}\times10^{6}$ (V/m).

b) $R < b$: $\bar{J}_i = \sigma\bar{E}_i = \bar{a}_R\, 7.5\times10^{10} R\, e^{-9.42\times10^{11}t}$

$R > b$: $\bar{J}_o = 0$.