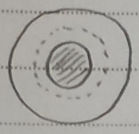
Subject : ۹۸۱۰۶۱۵۶ - محمّدهجری - کد ۲ Date .....

الف)



$$\int B.ds = \mu_0 i$$

$$B \times 2\pi R = \mu_0 i = \mu_0 \times \frac{\varepsilon}{R} e^{-\frac{t}{RC}}$$

$$\Rightarrow B = \frac{\mu_0 \varepsilon e^{-\frac{t}{RC}}}{2\pi R^2}$$

ب) قانون گاوس:

$$\int E.dA = \frac{q}{\varepsilon_0} \longrightarrow E \times 2\pi r L = \frac{q}{\varepsilon_0}$$

$$q = CV\left(1 - e^{-\frac{t}{RC}}\right)$$

$$\Rightarrow E = \frac{CV(1-e^{-\frac{t}{RC}})}{2\pi r L \varepsilon_0}$$

ج)

$$U = V \times u_B = AL \times u_B \xrightarrow{L=1} A u_B$$

$$= A \frac{B^2}{2\mu_0} = A \frac{\frac{\mu_0^2 \varepsilon^2 e^{-\frac{2t}{RC}}}{4\pi^2 R^4}}{2\mu_0} = \pi R^2 \frac{\frac{\mu_0^2 \varepsilon^2 e^{-\frac{2t}{RC}}}{4\pi^2 R^4}}{2\mu_0}$$

د)

$$U = \frac{1}{2} \frac{L}{\ell} \frac{i^2}{A^2} = \frac{B^2}{2\mu_0} \Rightarrow \frac{L}{\ell} = \frac{2\pi R^2 B^2 r^2}{\mu_0 \times \varepsilon^2 e^{-\frac{2t}{RC}}}$$