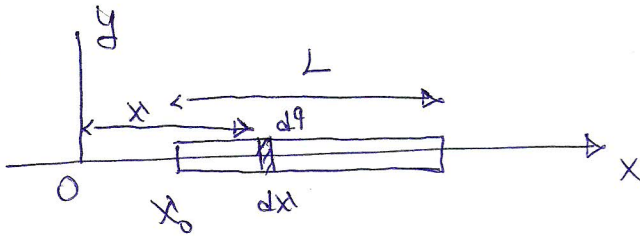


21-)



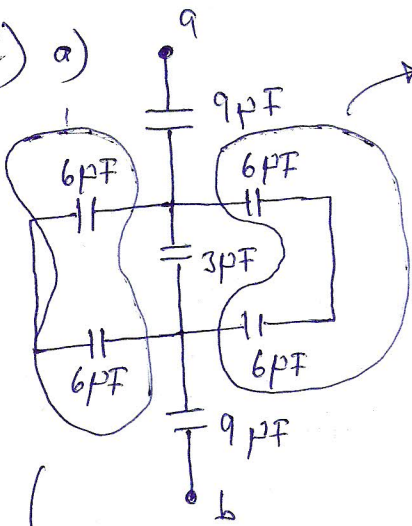
$$\lambda = \frac{\lambda_0 x}{x_0}$$

$$dq = \lambda dx = \frac{\lambda_0 x}{x_0} dx \quad (3P)$$

$$dE = k_e \frac{dq}{x^2} = k_e \frac{\lambda_0 x}{x_0 x^2} \Rightarrow E = k_e \int_{x_0}^{x_0+L} \frac{\lambda_0 dx}{x_0 x} = k_e \frac{\lambda_0}{x_0} \int_{x_0}^{x_0+L} \frac{dx}{x} \quad (5P)$$

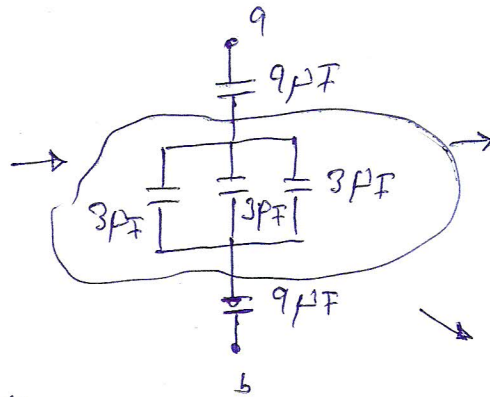
$$E = k_e \frac{\lambda_0}{x_0} \ln(x) \Big|_{x_0}^{x_0+L} = k_e \frac{\lambda_0}{x_0} \ln\left(\frac{x_0+L}{x_0}\right) \quad (2P)$$

22) a)



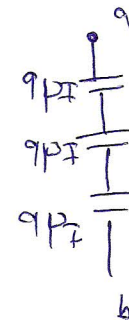
6 pF iki kondensatör seri old.

$$\frac{1}{C_{es1}} = \frac{1}{6} + \frac{1}{6} \Rightarrow C_{es1} = 3 \mu F. \quad (1P)$$



3 tane 3 pF paralel old.

$$C_{es2} = 3 + 3 + 3 = 9 \mu F. \quad (1P)$$



$$\frac{1}{C_{es}} = \frac{1}{9} + \frac{1}{9} + \frac{1}{9}$$

$$C_{es} = 3 \mu F. \quad (2P)$$

6 pF iki kondensatör seri old.

$$\frac{1}{C_{es2}} = \frac{1}{6} + \frac{1}{6} \Rightarrow C_{es2} = 3 \mu F \quad (1P)$$

b-)

$$U = \frac{1}{2} C_{es} (\Delta V)^2 \Rightarrow U = \frac{1}{2} (3 \times 10^{-6}) (60)^2$$

(1P)

$$U = 0,0054 \text{ J 'd} \Rightarrow (2P)$$