

$$v_{enc} = 0$$

$$v_{C_1}(0) = 0$$

$$s = j\omega$$

$$R_1 C_1 = \tau$$

$$Z_{C_1} = \frac{1}{sC}$$

$$V_{C_1}(s) = \frac{V_{cc}}{s} \frac{1/sC_1}{R_1 + 1/sC_1}$$

$$= V_{cc} \frac{1}{s(1 + sR_1C_1)}$$

Partial Fraction Method

$$= V_{cc} \left(\frac{k_1}{s} + \frac{k_2}{1 + s\tau} \right)$$

$$k_1 = sV_{C_1}(s)|_{s=0} = 1$$

$$k_2 = (1 + s\tau)V_{C_1}(s)|_{s=(-\frac{1}{\tau})} = -\tau$$

$$= V_{cc} \left(\frac{1}{s} - \frac{\tau}{s\tau + 1} \right)$$

$$\mathcal{L}^{-1}\{V_{C_1}(s)\} = v_{C_1}(t) = V_{cc} \left(1 - e^{-\frac{t}{\tau}} \right)$$