

Circuits and Transforms

EE3900: Linear Systems and Signal Processing

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1. DEFINITIONS

1.1 The unit step function is defined as

$$u(t) = \begin{cases} 1 & t > 0 \\ \frac{1}{2} & t = 0 \\ 0 & t < 0 \end{cases} \quad (1.1)$$

1.2 The Laplace transform of $g(t)$ is defined as

$$G(s) = \int_{-\infty}^{\infty} g(t)e^{-st} dt \quad (1.2)$$

2. LAPLACE TRANSFORM

2.1. In the circuit, the switch S is connected to position P for a long time so that the charge on the capacitor becomes $q_1 \mu\text{C}$. Then S is switched to position Q. After a long time, the charge on the capacitor is $q_2 \mu\text{C}$

2.2. Draw the circuit using latex-tikz

Solution:

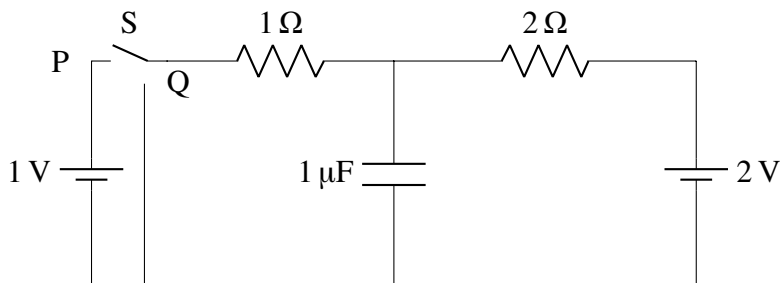


Fig. 2.2. Circuit diagram of the circuit in question