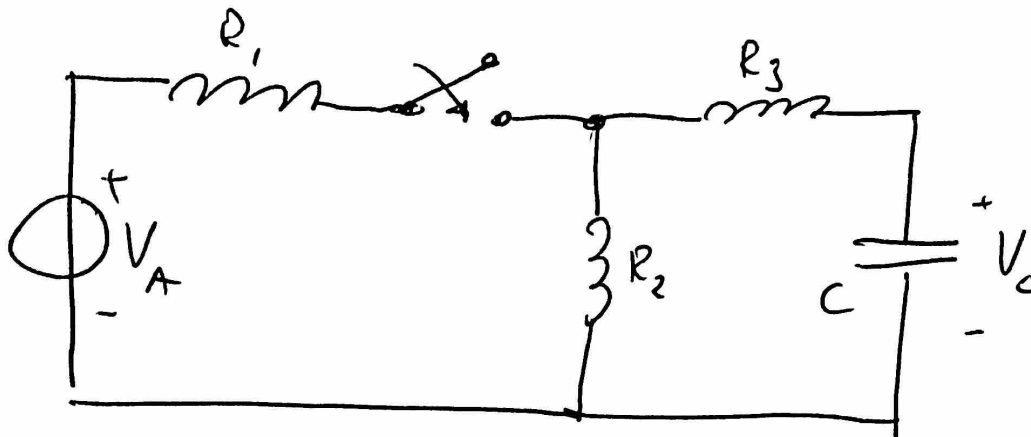


PROBLEM 4

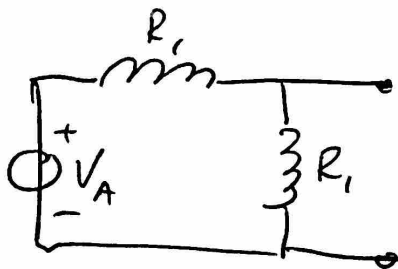


$$V_A = 6 \text{ V}$$

$$R_1 = R_2 = 10000 \Omega$$

$$R_3 = 5000 \Omega$$

$$C = 100 \text{ nF}$$



$$R = \frac{R_2 \cdot R_3}{R_2 + R_3} \Rightarrow \frac{10000 \cdot 5000}{10000 + 5000} = 3333 \Omega$$

$$V_C(\infty) = V_A \cdot \frac{R}{R + R_1} \Rightarrow 6 \cdot \frac{3333}{10000 + 3333} = 1.5 \text{ V}$$

$$V_C(0) = 0$$

$$R_{TH} = R + R_1 \Rightarrow 3333 + 10000 = 13333 \Omega$$

$$\tau = R_{TH} \cdot C \Rightarrow 13333 \cdot 0.0000001 = 0.0013333 \text{ s} = 1.3 \text{ ms}$$

$$V_C(t=0.002) = 1.5 + (0 - 1.5) \cdot e^{-\frac{0.002}{0.0013333}}$$

$$V_C(t=0.002) = 1.16 \text{ V}$$