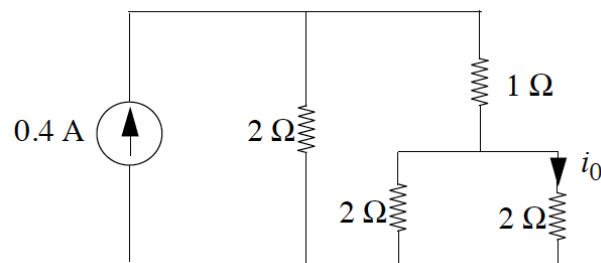Quiz 2 (Total 100 points)
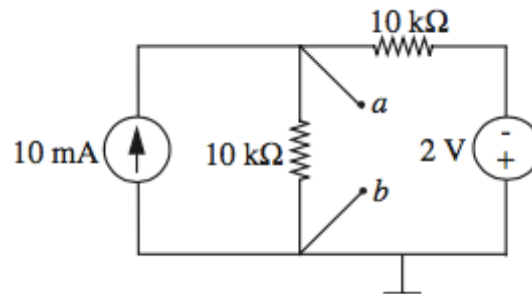
It is a closed-book, closed-note quiz. Cheating leads to 0% score.

Calculator is allowed. Please show the process of thinking/calculation. Indicate your final answers clearly. Unit is needed if applicable.
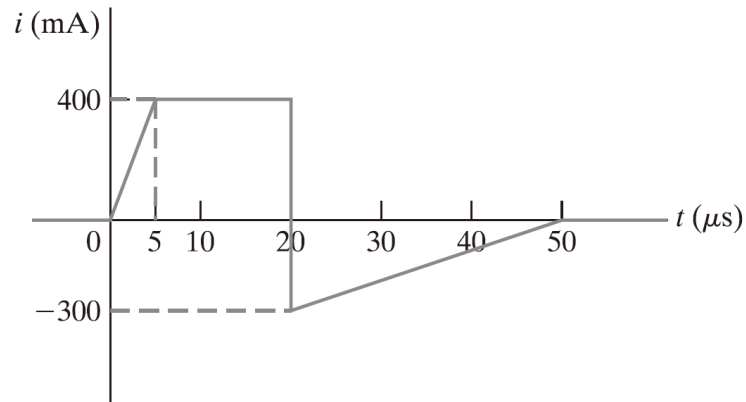
1. Find the current i_0 in the following figure. (14%)


2. Find the Thevenin equivalent circuit of the circuit at terminals a, b, in the following figure. (18%)

3. The current is applied to a capacitor as shown in the following figure. The capacitance of this capacitor is 1 μF. The initial voltage of the capacitor is zero.

(a) Derive and plot the voltage across the capacitor. (16%)

(b) Determine the energy stored in the capacitor at t = 30 μs. (8%)

4. Find the Norton equivalent circuit of the circuit at terminals A, B, in the following figure. (18%)
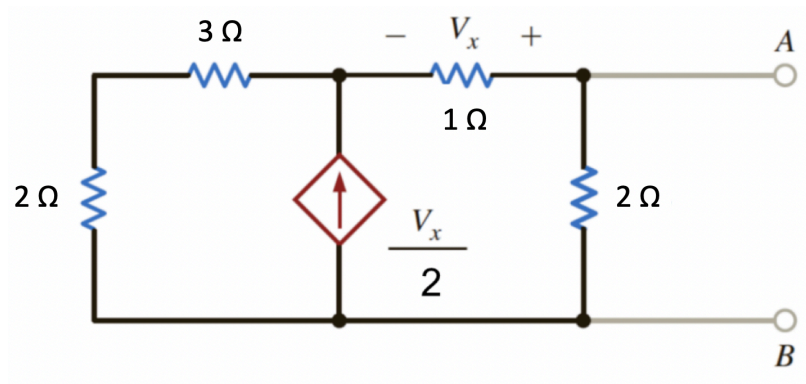
5. Analyze the following RC circuit where R = 10 kΩ and C = 1 µF. $v_O(t = 0) = 1$ V, and the input $v_S(t) = 4$ V for t ≥ 0. Derive and plot v_O for t ≥ 0. (26%)