This print-out should have 8 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

**001** 10.0 points

Find the current through the 21.2 Ω lower-right resistor. Answer in units of A.

**002** (part 1 of 2) 10.0 points

For a long period of time the switch \( S \) is in position “b”. At \( t = 0 \) s, the switch \( S \) is moved from position “b” to position “a”.

Find the voltage across the 2 MΩ center-left resistor at time \( t_1 = 3 \) s. Answer in units of V.

**003** (part 2 of 2) 10.0 points

Much later, at some time \( t'_0 = 0 \) s, the switch is moved from position “a” to position “b”.

Find the voltage across the 2 MΩ center-left resistor at time \( t' = 1.6 \) s. Answer in units of V.

**004** (part 1 of 2) 10.0 points

The switch has been open for a long period of time.

Immediately after the switch is closed, the current supplied by the battery is

1. \( I_0 = \frac{V (R_1 + R_2)}{R_1 R_2} \).
2. \( I_0 = \frac{V}{R_1} \).
3. \( I_0 = \frac{V}{R_2} \).
4. \( I_0 = 0 \).

**005** (part 2 of 2) 10.0 points

A long time after the switch has been closed, the current \( I_\infty \) supplied by the battery is

1. \( I_\infty = \frac{V}{R_2} \).
2. \( I_\infty = \frac{V}{R_1} \).
3. \( I_\infty = 0 \).
4. \( I_\infty = \frac{V}{R_1 + R_2} \).

**006** (part 1 of 2) 10.0 points
How long after the switch is closed does the voltage across the resistor drop to $V_f = 8.3\,\text{V}$? Answer in units of $\text{s}$.

007 (part 2 of 2) 10.0 points
What is the charge on the capacitor at this time? Answer in units of $\text{C}$.

008 10.0 points
At $t=0$ the switch $S$ is closed with the capacitor is uncharged.

What is the charge on the capacitor when $I = 2\,\text{mA}$? Answer in units of $\text{C}$.