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

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

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

003 10.0 points

Find the current through the 19.2 \( \Omega \) lower-right resistor. Answer in units of A.

004 (part 1 of 2) 10.0 points

How long after the switch is closed does the voltage across the resistor drop to \( V_f = 11 \text{ V} \)? Answer in units of s.

005 (part 2 of 2) 10.0 points
What is the charge on the capacitor at this time? Answer in units of C.

006 10.0 points
At \( t=0 \) the switch \( S \) is closed with the capacitor uncharged.

What is the charge on the capacitor when \( I = 1 \text{ mA} \)? Answer in units of C.

007 (part 1 of 2) 10.0 points
For a long period of time the switch \( S \) is in position “\( b \)”. At \( t = 0 \text{ s} \), the switch \( S \) is
moved from position “b” to position “a”.

Find the voltage across the 2 MΩ center-left resistor at time $t_1 = 5$ s. Answer in units of V.

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008 (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 $t' = 2$ s. Answer in units of V.