ECE 35, Winter 2022

Quiz 3

/ 12

Your sequence number	
Last name	
First + middle name(s)	
PID	

Instructions:

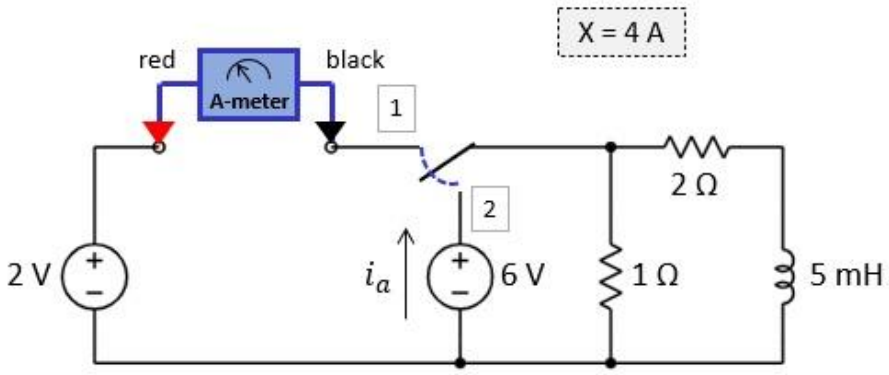
- Read each problem completely and thoroughly before beginning
- All calculations need to be done on these sheets
- Put a box around your answer for each question. Make sure you list units!
- Answers without supporting calculations will receive zero credit

(1) *(6 points)*

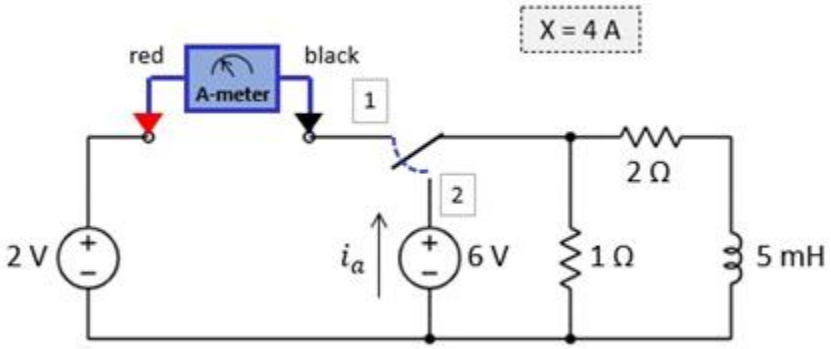
Consider the circuit below. For $t < 2$ s, the switch is in position 1 and it is possible that the system has not yet reached steady state.

When the ideal ammeter reading has a value of X, we move the switch from position 1 to position 2. This happens at time $t = 2$ s. The switch then remains in position 2.

Find $i_a(t)$ for $t > 2$ s. Write the equation.



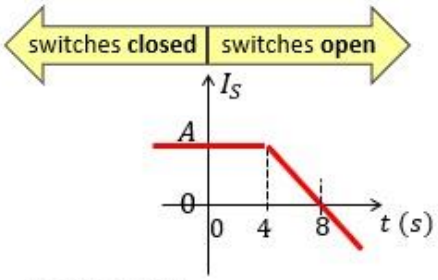
The circuit is also copied on the next page for your convenience.


X = 4 A
red
A-meter
black
1
2
2 Ω
2 V
i_a
6 V
1 Ω
5 mH

(2) *(6 points)*

Consider the circuit below.

For $t < 0$ s, both switches are closed, and the system has reached steady state.
At time $t = 0$ s, both switches open and remain open.
The current I_S varies as shown in the graph.



$A = 6$ A

a. Find the node voltage v_a at time $t = 0^+$ s (i.e., immediately after the switches open).
b. Find the node voltage v_b at time $t = 0^+$ s.
c. Find the node voltage v_a at time $t = 6$ s.
d. Find the node voltage v_b at time $t = 6$ s.