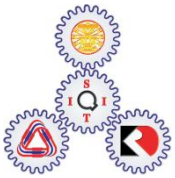

Sirindhorn International Institute of Technology

Thammasat University at Rangsit

School of Information, Computer and Communication Technology

ECS 203: Problem Set 4

Semester/Year: **2/2015**
Course Title: Basic Electrical Engineering
Instructor: Asst. Prof. Dr. Prapun Suksompong (prapun@siit.tu.ac.th)
Course Web Site: http://www2.siit.tu.ac.th/prapun/ecs203/

Due date: Feb 15, 5 PM

Instructions

1. Solve all problems. (5 pt)
   a. Write your name and ID on the top of **every** submitted page.
   b. For each part, write your explanation/derivation and answer in the space provided.
2. ONE sub-question will be graded (5 pt). Of course, you do not know which part will be selected; so you should work carefully on all of them.
3. There is no need to submit (or even print out) page 1 (this cover sheet).
4. Late submission will be rejected.
5. ***Write down all the steps*** that you have done to obtain your answers. You may not get full credit even when your answer is correct without showing how you get your answer.

Questions

1) Consider the circuit in Figure 1. Observe that all node voltages are provided (possibly by someone else performing steps 1-3 of nodal analysis for us). Here, we are trying to do step 4 of the nodal analysis.

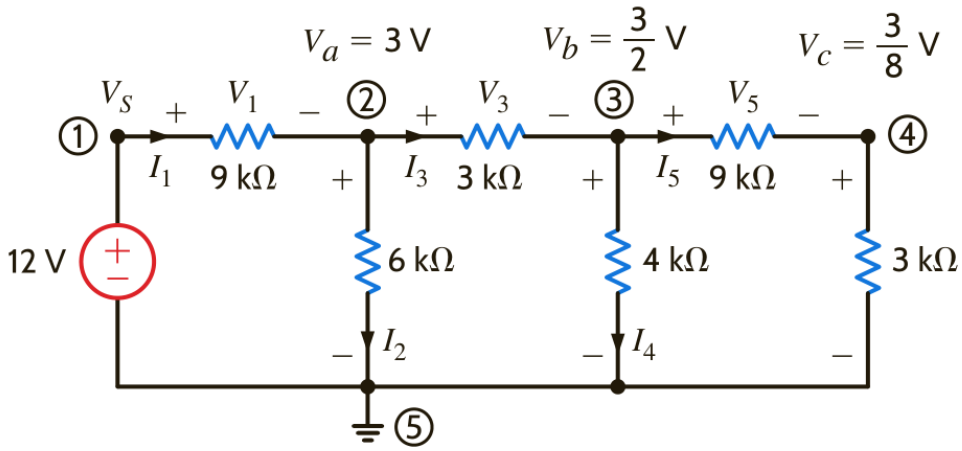

Figure 1

a) Find the value of V_S

b) Find the values of I_1, I_2, I_3, I_4, and I_5.
Hint: The current I flowing from node a to node b through a resistor R is $I = \frac{V_a - V_b}{R}$.

I_1 =	I_2 =
I_3 =	I_4 =
I_5 =	

c) Find the values of V_1, V_3, and V_5.
Hint: $V_{ab} = V_a - V_b$

V_1 =	V_3 =	V_5 =

2) [Irwin and Nelms, 2011, E3.7] Use nodal analysis to find V_0 and then the current I_0 in the circuit in Figure 2. (Note that the reference node is specified for you already in the figure.)

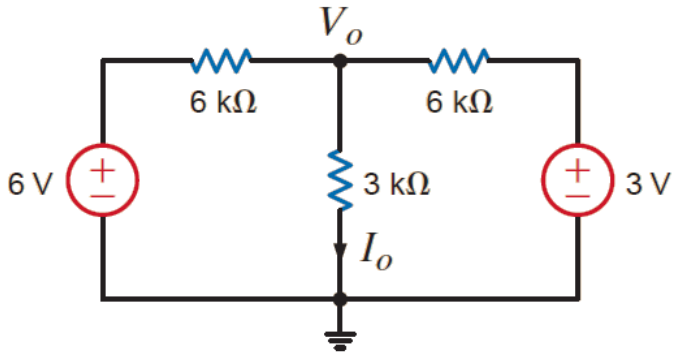

Figure 2

3) [Alexander and Sadiku, 2009, Q3.18] Determine the node voltages in the circuit in Figure 3 using nodal analysis.

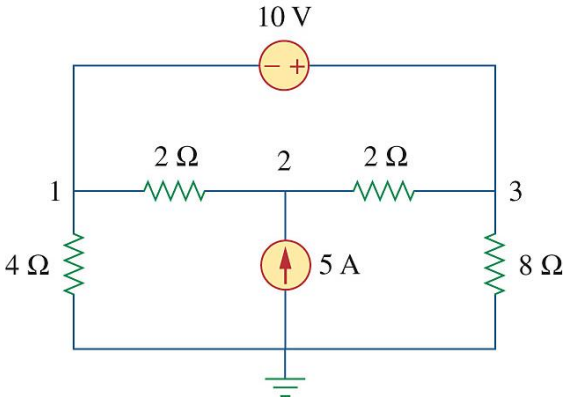

Figure 3

4) [Alexander and Sadiku, 2009, Q3.2] For the circuit in Figure 4, obtain v_1 and v_2 using nodal analysis.

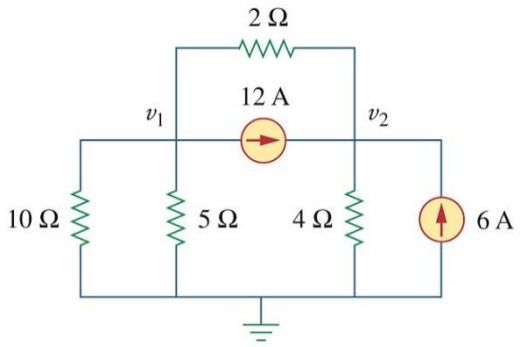

Figure 4

5) [Alexander and Sadiku, 2009, Q3.6] Use nodal analysis to obtain v_0 in the circuit in Figure 5.

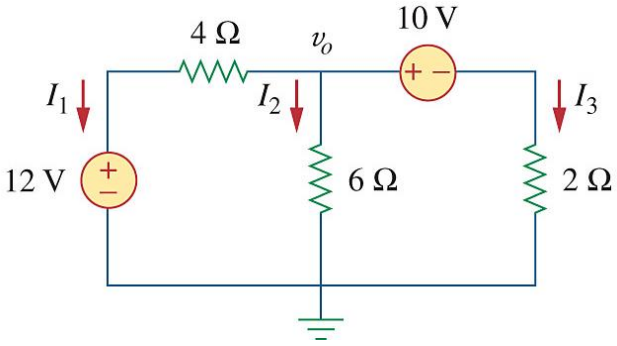

Figure 5