

Sirindhorn International Institute of Technology

Thammasat University at Rangsit

School of Information, Computer and Communication Technology

## ECS 203: Problem Set 8

**Semester/Year:** 2/2015

**Course Title:** Basic Electrical Engineering

**Instructor:** Asst. Prof. Dr. Prapun Suksompong ([prapun@siit.tu.ac.th](mailto:prapun@siit.tu.ac.th))

**Course Web Site:** <http://www2.siiit.tu.ac.th/prapun/ecs203/>

**Due date: Mar 28, 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) [Alexander and Sadiku, 2009, Q5.37] Determine the output of the summing amplifier in Figure 1.

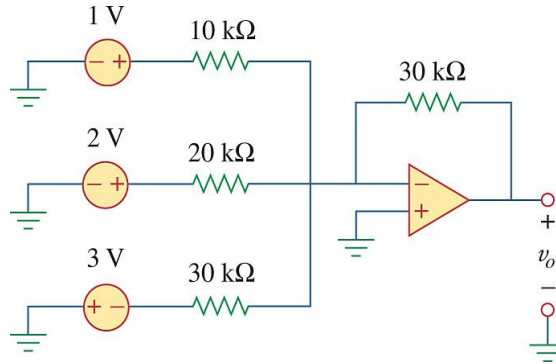


Figure 1

- 2) [Alexander and Sadiku, 2009, Q5.47] Consider the circuit in Figure 2. Find  $v_o$  given that  $v_1 = 1V$  and  $v_2 = 2V$

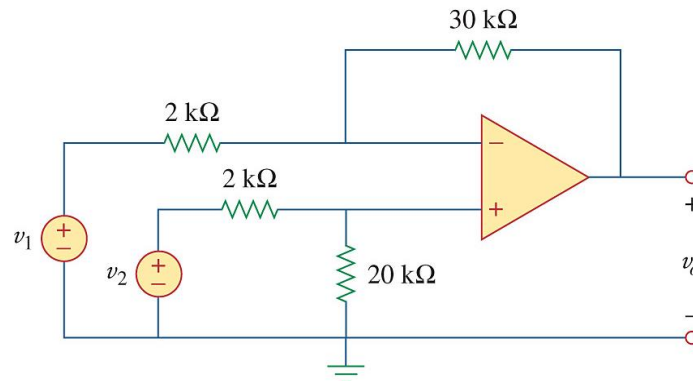


Figure 2

Hint: It is a difference amplifier.

- 3) [Alexander and Sadiku, 2009, Q5.29] Determine the voltage gain  $v_o/v_i$  of the op amp circuit in Figure 3.

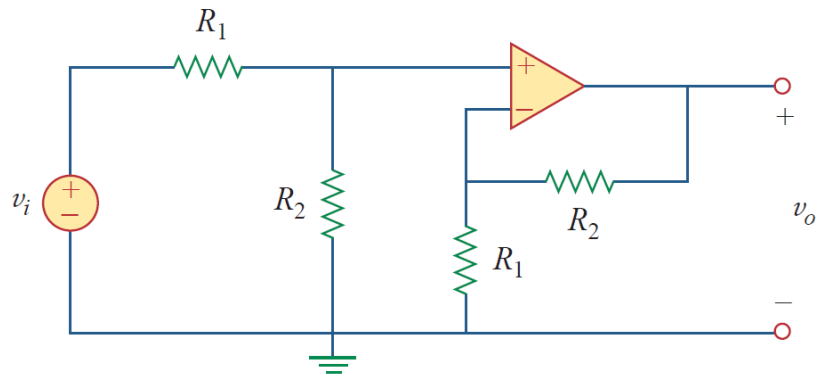


Figure 3

- 4) [Alexander and Sadiku, 2009, Q5.21] Use **superposition theorem** to calculate  $v_o$  in the op amp circuit of Figure 4.

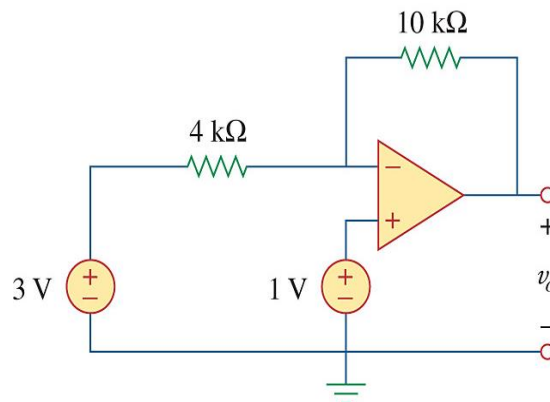


Figure 4

5) [Alexander and Sadiku, 2009, Q5.57] Find  $v_o$  in the op amp circuit of Figure 5.

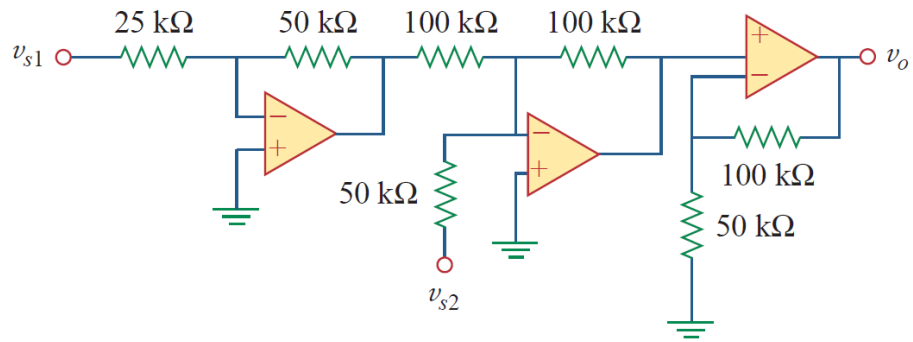


Figure 5

