

SIMON FRASER UNIVERSITY  
SCHOOL OF ENGINEERING SCIENCE

Fall 2017  
ENSC 220: ELECTRIC CIRCUITS I

Midterm Examination No. 2  
Wednesday, November 15, 2017

*Duration: 50 minutes. Attempt all problems. Questions may not be equally weighted. Closed book and closed notes. PDAs, laptops, and wireless phones are not permitted. Simple calculators are permitted. Please write legibly. Illegible text will not be graded.*

1. (20 points)

Find the Thévenin equivalent circuit seen by the load shown in Figure 1.

2. (20 points)

For the circuit in Figure 2:

- Find  $v_o$  in terms of  $v_s$ .
- Find  $i_o$  for  $v_s = 1V$ .

3. (30 points)

Find the input-output relationship of the RC op-amp circuit shown in Figure 3.

4. (30 points)

The inverting op amp shown in Figure 4 is driven by a step input  $v_s(t) = 2u(t)$ . If  $v_c(0) = V_0$ , find  $v_2(t)$  and  $i_s(t)$  for  $t \geq 0$ . Draw the graphs for  $v_2(t)$  and  $i_s(t)$ .

Figure 1:

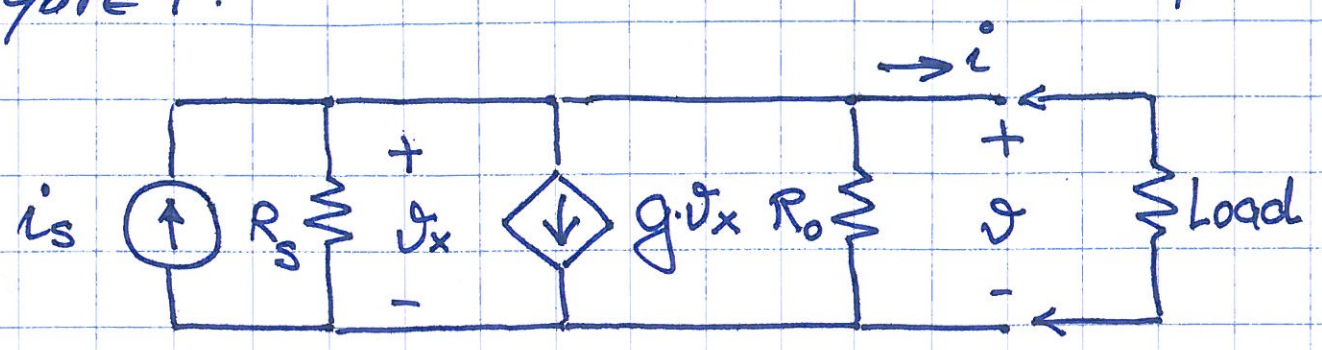


Figure 2:

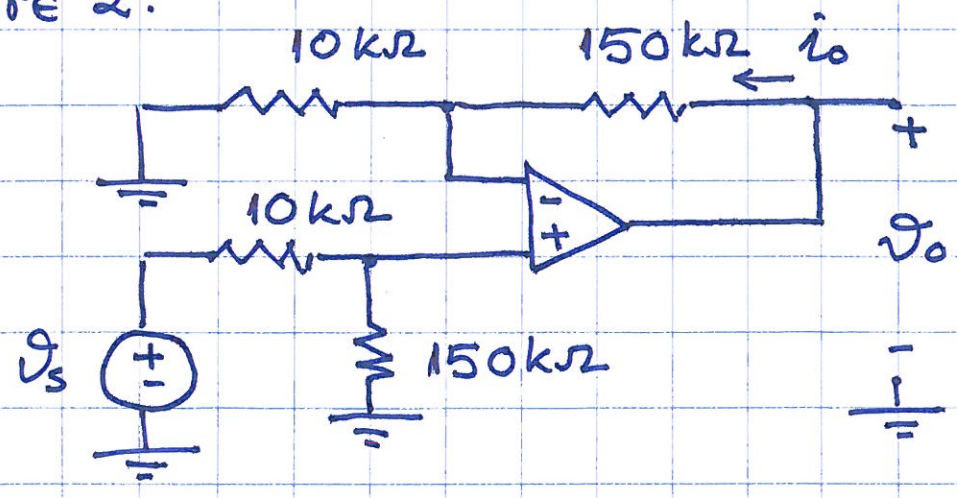


Figure 3:

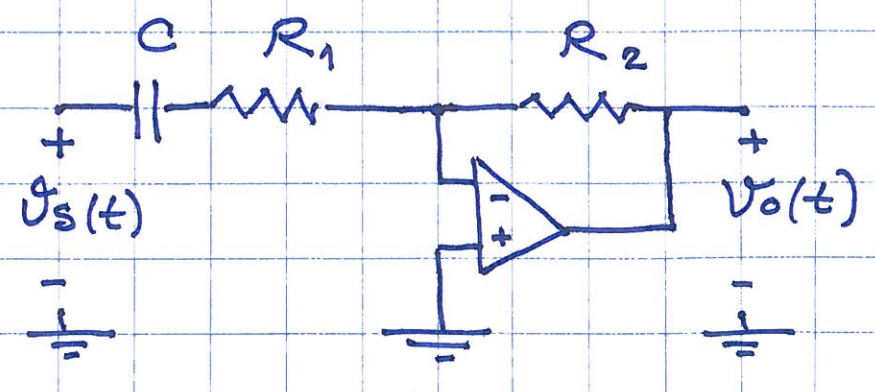


Figure 4:

