

ECE 35, Fall 2018

Quiz 2

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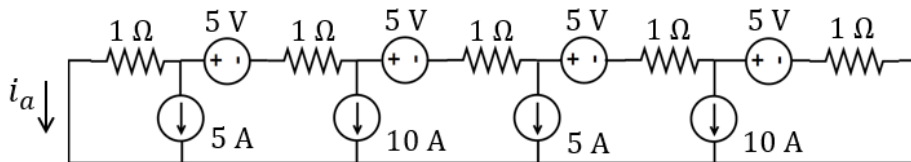
Last name

First + middle  
name(s)

PID

**Instructions:**

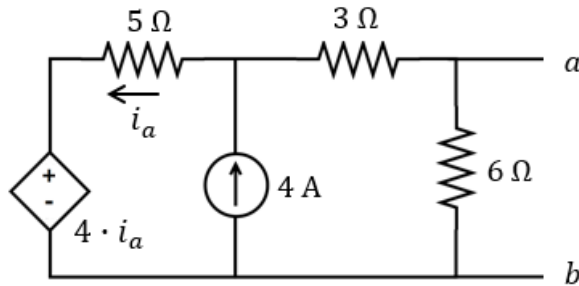
- Read each problem completely and thoroughly before beginning
- All calculations need to be done on these sheets
- Write your answers in the answer boxes for each question. Make sure you list units!
- Answers without supporting calculations will receive zero credit

(1) Find  $i_a$ . (4 points) $i_a$ 

- (2) (a) Find the load resistor  $R_L$  that needs to be attached between  $a$  and  $b$  to maximize the power in  $R_L$ . (4 points)
- (b) Assume that with the  $R_L$  you found in part (a), the power received by  $R_L$  is  $P_1$ . When you change the independent current source to 8 A, this power changes to  $k \cdot P_1$ . What is the value of  $k$ ? (1 point)

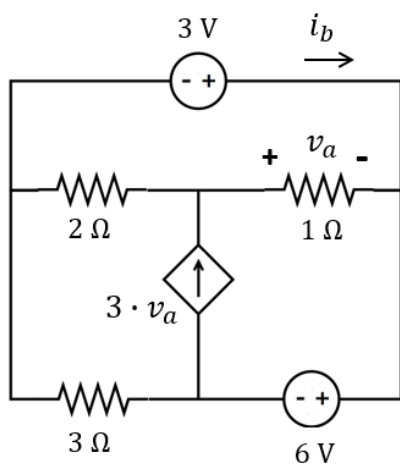
$R_L$

$k$



- (3) Find  $i_b$ . You must use MESH analysis. First write all your equations; then solve. (6 points)

 $i_b$ 



- (4) Below you see three configurations with the same unknown circuit. When a  $1\ \Omega$  resistor is attached, the power received by that resistor is  $9\ \text{W}$ . When a voltage source of  $5\ \text{V}$  is attached, the current is  $1\ \text{A}$ .

What is the current  $i_a$  when the two terminals are shorted together? (5 points)

$i_a$

