King Fahd University   **of Petroleum & Minerals**

Electrical Engineering Department
EE 201 Electric Circuits I
Third Semester (103)

Exam I
Monday, 18 July 2011
7:00 pm – 8:30 pm

Name: _____

ID: _____

Section: _____

Problem	Score	Out of
1		21
2		17
3		18
4		19
Total		75

Clearly present your work and show, on the circuit drawing, all the variables used in the calculation.

When applicable, make sure to use the specified method to solve the question(s).

Good Luck

Problem 1

Consider the circuit below. Using KCL, KVL and Ohm's law:
1. Calculate the voltage V_S.
2. Calculate the voltage V_X.
3. Fill the table below and verify power conservation. (IMPORTANT: Show all variables with their values on the circuit drawing). In the Power column of the table, report the power delivered to each element.
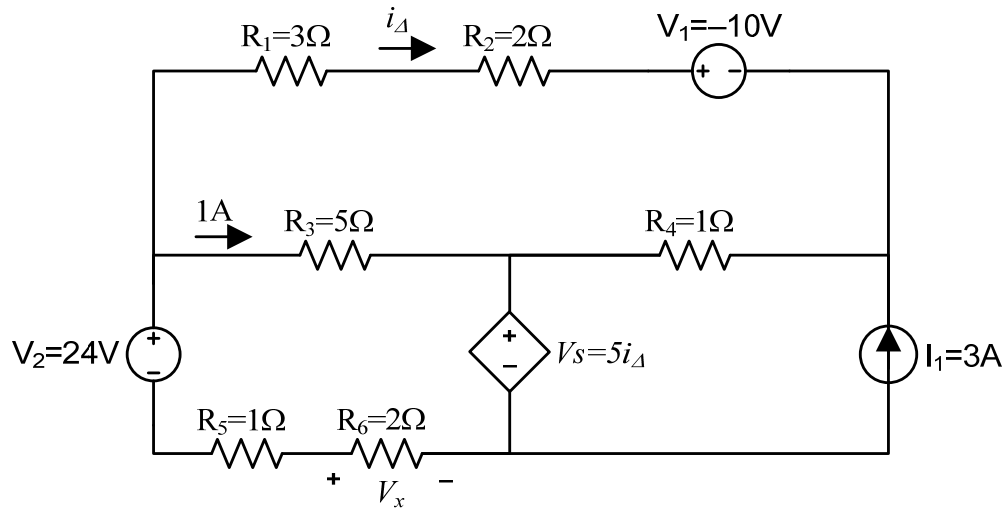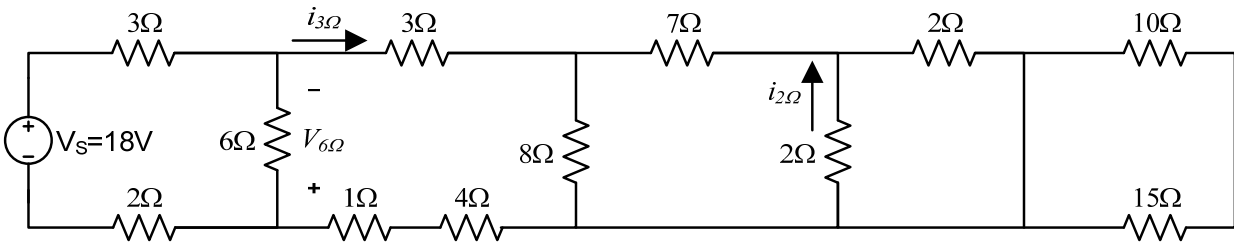

| Element	Current (A)	Voltage (V)	Power (W)	Absorbed or developed
R_1				
R_2				
R_3				
R_4				
R_5				
R_6				
V_1 source				
V_2 source				
V_S source				
I_1 source				

Problem 2

Consider the circuit below.

1. Using circuit reduction and voltage division of V_S, calculate $V_{6\Omega}$.
2. Find the current $i_{3\Omega}$
3. Find the current $i_{2\Omega}$ using current division of $i_{3\Omega}$

Problem 3

Consider the circuit below.
1. Write the node-voltages equations.
2. Put these equations in the matrix form.

2A

i_o

2Ω

$Vs=4i_o$

V_1 5Ω V_2 V_3

4Ω 3Ω

8Ω 6Ω

24V 7Ω

1Ω

V_{ref}
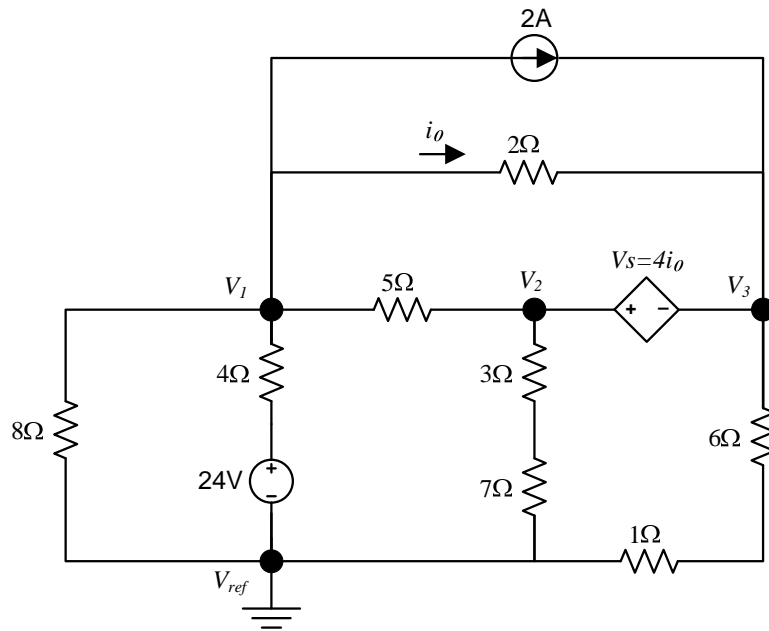
Problem 4

Consider the circuit below.
1. **Write the mesh-currents equations. (put them in the matrix form)**
2. **Find the value of $V_{2\Omega}$.**