King Fahd University of Petroleum & Minerals
Electrical Engineering Department

EE204 : Electric Circuits

Semester 101

First Major Exam

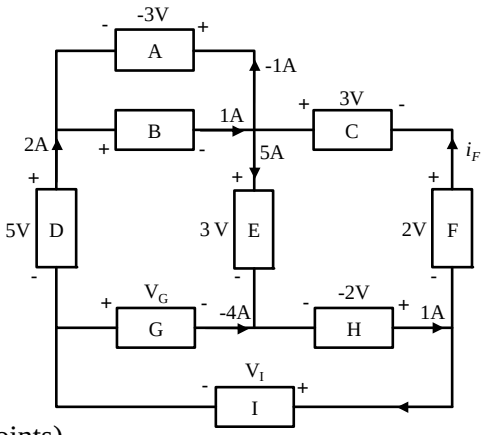
Time : 1 hr 30 min

Section No. _____

Student Name _____

Student ID _____

Q#1	10	
Q#2	10	
Q#3	10	
TOTAL	30	



Problem I:

Part 1: (5 points)

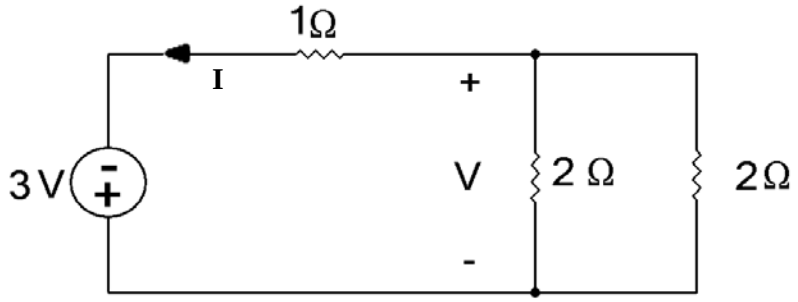
Consider the circuit shown above:

1. Calculate the current i_F. (1 point)
2. Calculate the voltage V_G. (1 point)
3. Calculate the voltage V_I. (1 point)
4. Calculate the power associated with the element B. (2 points)

Problem I:

Part 2: (5 points)

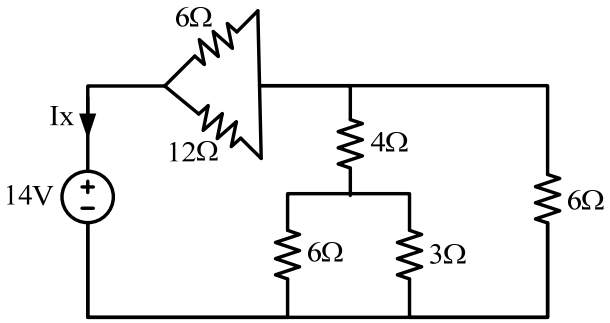
For the circuit shown below, use KVL, KCL, Ohms law along with series /parallel reduction to compute the current I and the voltage V.



Problem II:

Part 1: (5 points)

Using circuit reduction technique, find the value of current Ix.



Problem II:

Part 2: (5 points)

If the current in a circuit is

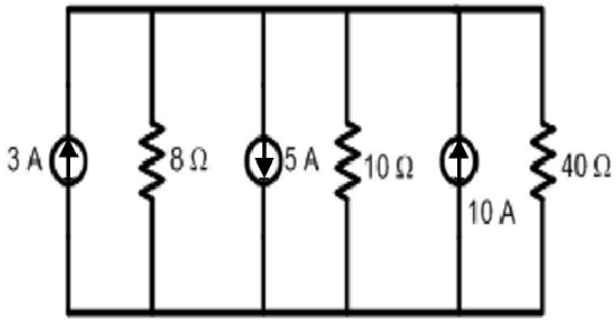
$$i = \begin{cases} 25\ A & 0 \le t \le 2 \\ -25\ A & 2 \le t \le 6 \\ 25\ A & 6 \le t \le 8 \end{cases}$$

- Sketch the current as a function of t
- Find the charge Q(t) flowing in the circuit as a function of t
- Sketch Q(t).

Problem III:

Part 1: (5 points) Use current divider rule to find:

1. Current flowing down in the 10 Ohms resistor.
2. The power associated with the 10 A current source
3. State whether this power is been absorbed or delivered.



Problem III:

Part 2: (5 points) Apply source transformations to reduce the circuit shown to a single loop, then find v_x.