MEMS 0031 - Electrical Circuits
Quiz #1
May 15th, 2019
90 points

Name: _____

Problem #1

(5 pts.) Given that current is the time-rate-of-change of charge, and that $i(t)$=5·sin(3t) [A], determine the charge $q(t)$ for $t \geq 0$:

Problem #2

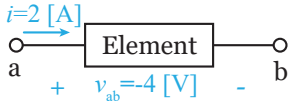
(5 pts.) Given $q(t)=e^{-10t}$, determine the current $i(t)$ for $t \geq 0$:

Problem #3

(5 pts.) Given $i(t)=3t^3$ and $v(t)=3t^{-2}$, determine $P(t)$ for $t \geq 0$:

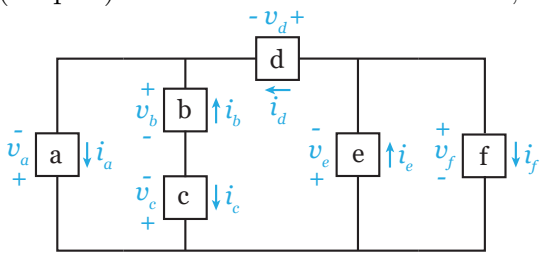
Problem #4

(5 pts.) Given the schematic below, determined the power **supplied**:



Problem #5

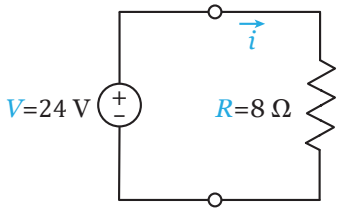
(40 pts.) Given the schematic below, does the circuit satisfy the Conservation of Power?



Element	Voltage [kV]	Current [mA]
a	-3	-250
b	4	-400
c	1	400
d	1	150
e	-4	200
f	4	50

Problem #6

(15 pts.) Give the schematic below, determine a) the current flowing through the resistor and b) the power dissipated by the resistor.



Problem #7

(15 pts.) Give the schematic below, determine a) the resistance of the resistor and b) the power dissipated by the resistor.