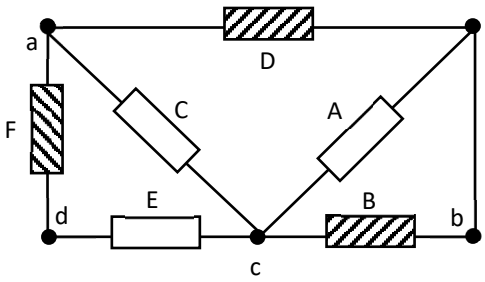
Fourth Test, Introduction to Electrical Technology, April 1, 2020, Danilo Rairán, Group: _____

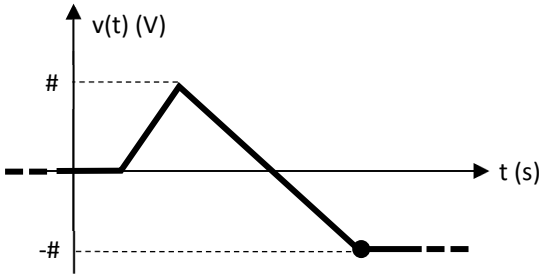
Name: _____ Code: _____

= last digit of your code plus one

1) Using the circuit in the figure: **a**) Indicate voltages and currents and compute the power balance, **b**) define reasonable values (it is, don't brake Kirchhoff laws) for voltage and currents and repeat the power balance computation.



2) The figure shows the voltage in an element. The first transition happens at # (ms), the second transition at 2# (ms), and the third transition at 5# (ms). If the current enters for the negative terminal of the element, and it is $i(t) = -1.5 \times 10^{-2}(dv(t)/dt)\ (A)$ **a**) Compute the electric power ∀t, **b**) When is the element generating electricity? **c**) When is the power lower than -2# (W)?



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1) a /1,5

b /1,0

2) a /1,5

b /0,5

c /0,5

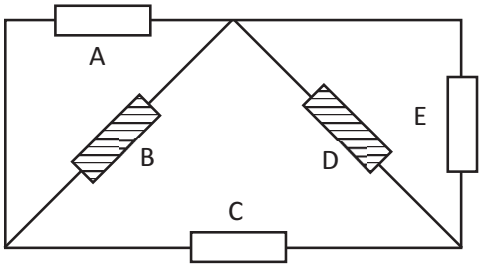
Fourth Test, Introduction to Electricity, August 20, 2020, Danilo Rairán, Group: _____

Name: _____ Code: _____

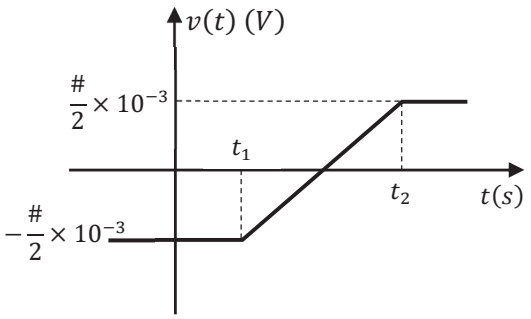
= ***last digit of your code plus one***

1. There are three electrical devices in a home: a fridge, a microwave, and light bulbs. The fridge consumes 2*# kW and works three times during the day, 1.5 hours each time. The microwave consumes 3 kW and it is used to warm lunch and dinner, 30*# minutes each time. Finally, 20 light bulbs of 100(#/2) W each are *on* during 12 hours per day. **a**) plot a graph with the daily power consumption, **b**) what is the average power consumption? **c**) considering equal power consumption every day, and given the price of a kWh equal to $ 500 COP, how much does it cost the energy in a month?

2. Using the circuit in the figure: **a**) Indicate voltages and currents and compute the power balance, **b**) define reasonable values (it is, don't brake Kirchhoff laws) for voltage and currents and repeat the power balance computation.



3. The function in the figure corresponds to the voltage in an element, $t_1 = \# \times 10^{-3}\ s$, $t_2 = 2\# \times 10^{-3}\ s$. Knowing that $i(t) = -1 \times 10^{-6}(dv(t)/dt)$, and the current enter through the negative terminal of the element, **a**) Compute both graph and equation for the electric power, **b**) Compute both graph and equation for the Energy, **c**) Indicate the intervals of time when the element is generating or consuming energy?



1.	a	/0.6	2.	a	/0.9	3.	a	/0.7
	b	/0.5		b	/0.8		b	/0.7
	c	/0.5					c	/0.3

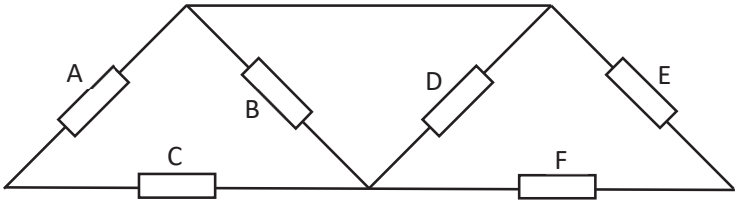
Fourth Test, Introduction to Electricity, September 28, 2021, Danilo Rairán, Group: _____

Name: _____ Code: _____

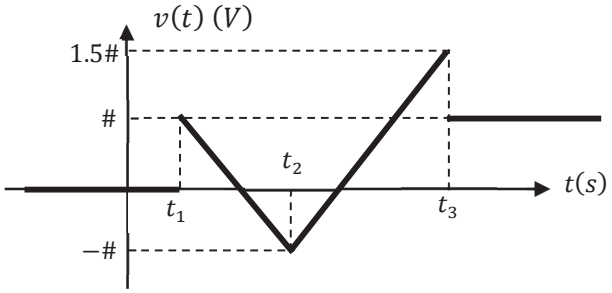
= ***to be define by the professor during the test***

1. There are four electrical devices in a home: a fridge, a microwave, light bulbs, and a computer. The fridge consumes 200*# W and it is alternating on and off for one hour in each state. The microwave consumes 1500*# W and it is used to warm breakfast, lunch and dinner, 30*# minutes each time. Finally, light bulbs consume 400*# W from 4 am to 7 am and from 6 pm to 10 pm. The computer consumes 200*# W, and it works from 10 am to 8 pm continuously. **a**) plot a graph with the daily power consumption, **b**) what is the total average power consumption? **c**) considering equal power consumption every day, and given the price of a kWh equal to $ 600 COP, how much does it cost the energy in a month?

2. Using the circuit in the figure: **a**) Indicate voltages and currents and compute the power balance, **b**) define reasonable values (it is, don't brake Kirchhoff laws) for voltage and currents and repeat the power balance computation.



3. The function in the figure corresponds to the voltage in an element, $t_1 = \# \times 10^{-3}\ s$, $t_2 = 2\# \times 10^{-3}\ s$, $t_3 = 3.5\# \times 10^{-3}\ s$. Knowing that $i(t) = -2 \times 10^{-3}(dv(t)/dt)$, and the current enter through the positive terminal of the element, **a**) Compute both graph and equation for the electric power, **b**) Compute both graph and equation for the Energy, **c**) Indicate the intervals of time when the element is generating or consuming energy?



1.	a	/0.6	2.	a	/0.9	3.	a	/0.7
	b	/0.5		b	/0.8		b	/0.7
	c	/0.5					c	/0.3

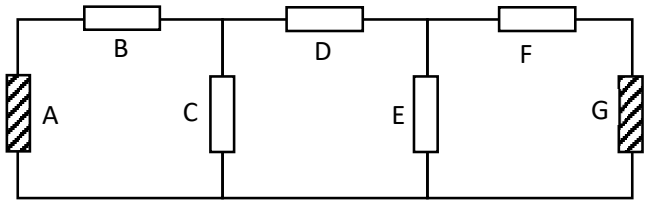
Fourth Test, Introduction to Electricity, March 29, 2022, Danilo Rairán, Group: _____

Name: _____ Code: _____

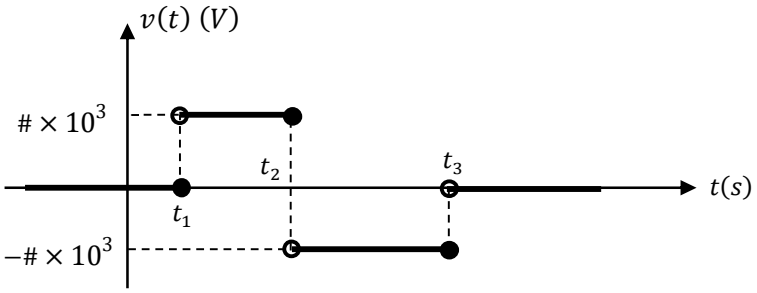
 # = to be define by the professor during the test

1. Knowing the relationship between electric power and Energy and that the units of Energy are units of power per time (Ws), or Jouls (J), and that the capacity of a battery is measured in milli Amperes per hour (mAh), **a**) What is 1 mAh equivalent to? **b**) If the voltage of a batteries is 1.5 V, What is the electric charge of a battery if its capacity is 2300 mAh?

2. Using the circuit in the following figure: **a**) Indicate voltage polarities and current senses and compute the power balance, **b**) define reasonable values (it is, don't brake Kirchhoff laws) for voltage and currents, and repeat the power balance computation.



3. The function in the figure corresponds to the voltage in an element. If $t_1 = \# \times 10^{-6}\ s$, $t_2 = 2\# \times 10^{-6}\ s$, $t_3 = 4\# \times 10^{-6}\ s$, and knowing that $i(t) = 2 \times 10^3 \int v(t)dt$, and the current enter through the negative terminal of the element, **a**) Compute both graph and equation for the electric power, **b**) Compute both graph and equation for the Energy, **c**) What is the Energy at $t = 1.5\#\ \mu s$, When is the power positive?



1.	a	/0.5	2.	a	/0.9	3.	a	/0.8
	b	/0.7		b	/0.8		b	/0.8
							c	/0.5