

PSDE4001 Principles. Assignment 1.

by Alun Gealy

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HNC Electrical and electronic engineering

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Assignment title – Investigation into DC
transients

Lecturer – Robert Jenkins

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1 Introduction

*No first person
terms should be
used in any
report*

In this assignment I will be looking into DC transient circuits including RC and RL series circuits. I will carry out some practical exercises, using an electrical circuit simulation software (multisim) and also using mathematic formulas to get analysis and then using all this data to make comparisons between the 3 methods, whilst giving reasons for any discrepancies.

I will analyse the circuits when DC voltage is applied to the circuits (charge) and also when the DC voltage is removed (discharge) I will get a table of results and also create graphs to get a better view of these results.

To get my readings I will be using different types of measuring equipment, for the practical exercise I will use multimeters and probes, for the simulation circuit I'll be using an oscilloscope and for the calculated values I will be using mathematic formula.

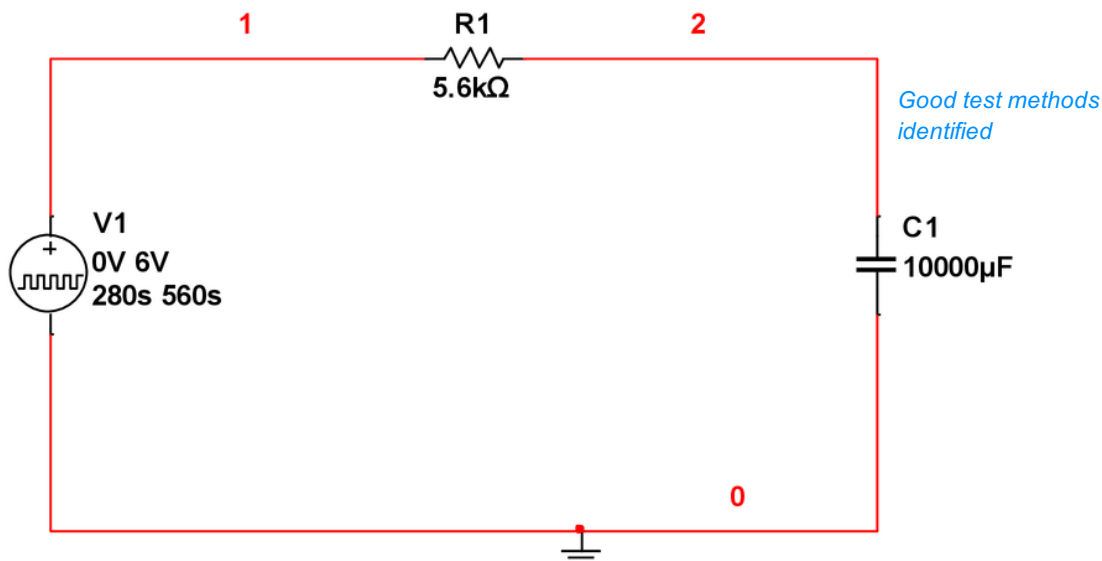
Once I have all the readings, I will be making a comparison between the 3 methods t 3 instantaneous times and final values. They should be very similar bur discrepancies can occur and I will be giving any reasons for this.

*The intro is
informative but
the grammar is
poor*

2. Task 1

In this task I will be analysing the transient behaviour of a charging capacitor in a RC circuit. An RC circuit comprises of a power supply (V), a resistor(R) and a capacitor(C).

Below is the circuit we will be analysing.

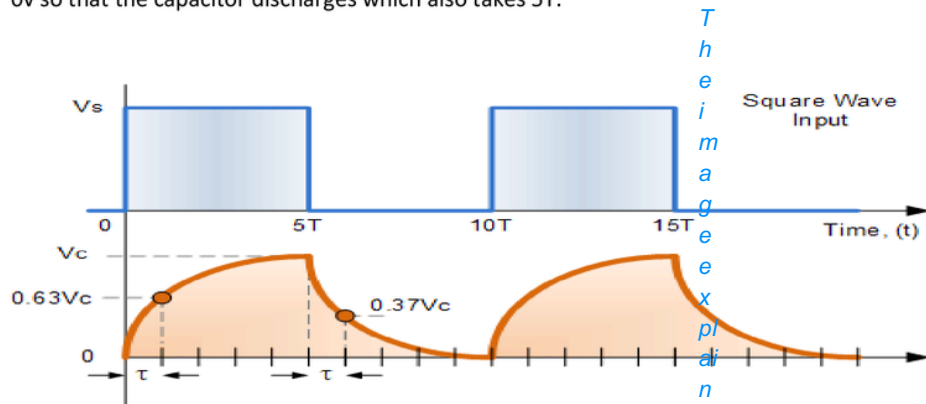


2.1 Research

The reasoning behind the capacitor and resistor values is so that we can have a large transient period, so that when we do a practical exercise we can take accurate readings, most RC circuits would have a very low transient time, so would be impractical and also cause discrepancies in our readings

You may notice I have included a pulsing Voltage supply, the reason behind this is so that I can simulate the charge and discharge, when the pulse is positive (6v) it will charge the capacitor then when the pulse is negative (0v) it will discharge. I found this graph below which explains this very well. As you can see, after 5T the capacitor reaches its full capacity then the voltage pulse returns to

0v so that the capacitor discharges which also takes 5T.



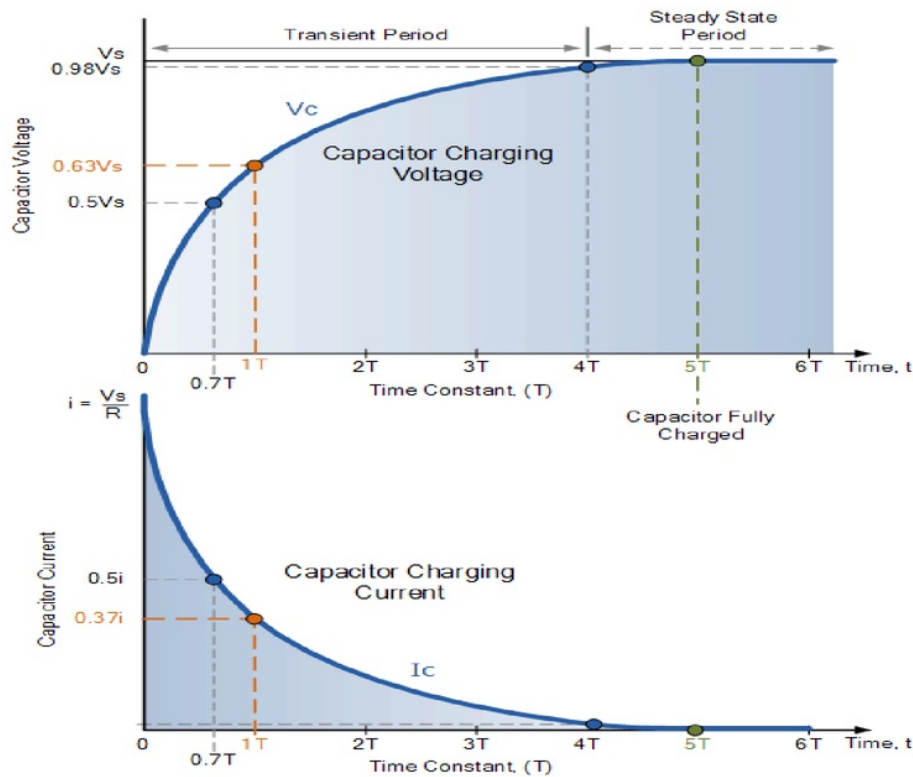
(Aspen-core, 2018)

First we will need to work out our Time constant (T). Time constant is the time delay between a circuit's input and output when a voltage or signal is first applied. The formula for Time constant is $T = R \times C$ so the time constant for this circuit will be $T = R \times C = 5.6K\Omega \times 10000\mu F = 56\text{seconds}$.

Given that $T = 56\text{s}$, our transient period would be $5T = 280\text{s}$. The transient period is the time a capacitor takes to fully charge. This is why our train power supply is set at 280sec (5T) to charge, then 560sec (10T) to fully discharge.

This applies to both Voltage and current, the graphs below illustrates this.

Significant points and the test method is identified here



(Aspen-core, 2018)

2.2 Calculated results.

The formula for instantaneous voltage $V_c = V_{max}(1 - e^{-t/T})$ Where V_{max} = Voltage supply.

and for the current its $I_c = I_{max}(e^{-t/T})$ where $I_{max} = \frac{V}{R} = \frac{6}{56000} = 1.071$ *Units should be included*

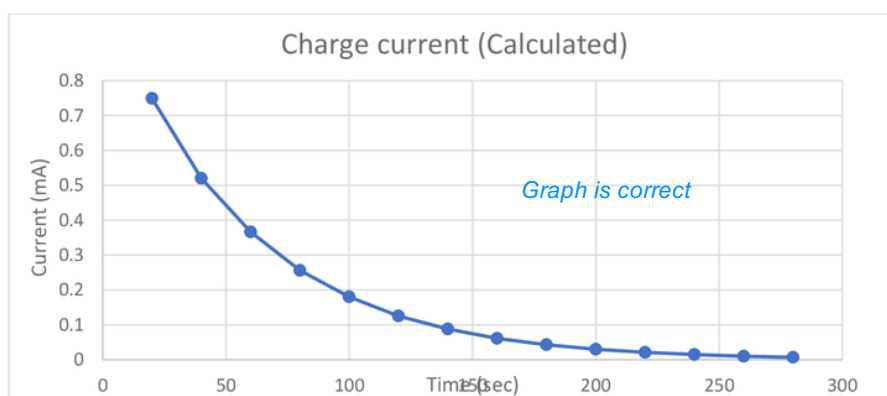
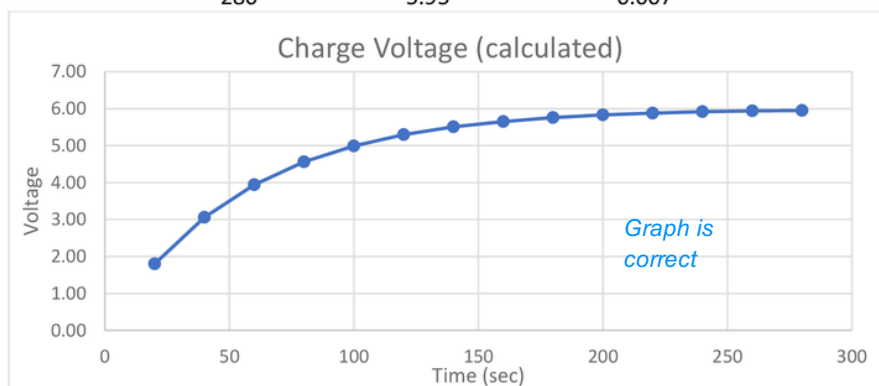
By using these formulas I can now get a table of results for the charge up to 280sec (5T) which is it maximum as it would be fully charged

Calculated charge results for RC circuit

Time (sec)	Voltage(V)	Current(mA)
20	1.80	0.749
40	3.06	0.520
60	3.94	0.366
80	4.56	0.256
100	4.99	0.180
120	5.30	0.125
140	5.51	0.088
160	5.65	0.061
180	5.76	0.043
200	5.83	0.030
220	5.88	0.021

Only 3 instantaneous times were needed

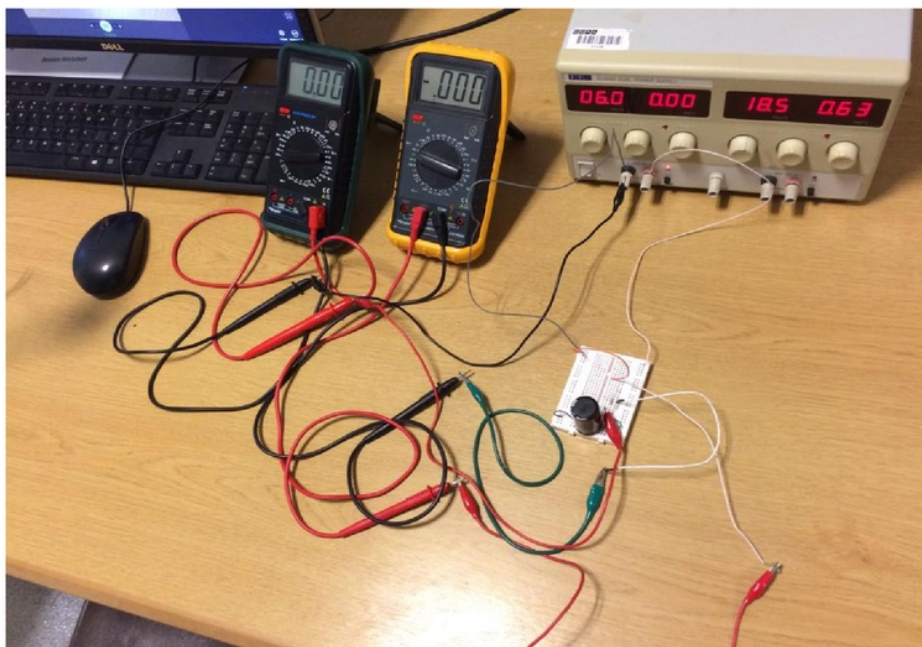
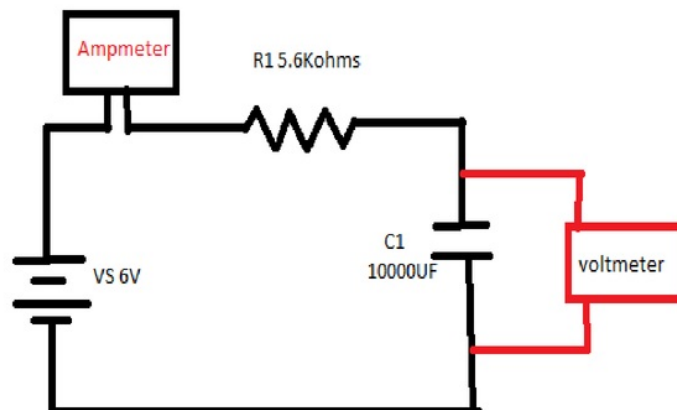
240	5.92	0.015
260	5.94	0.010
280	5.95	0.007



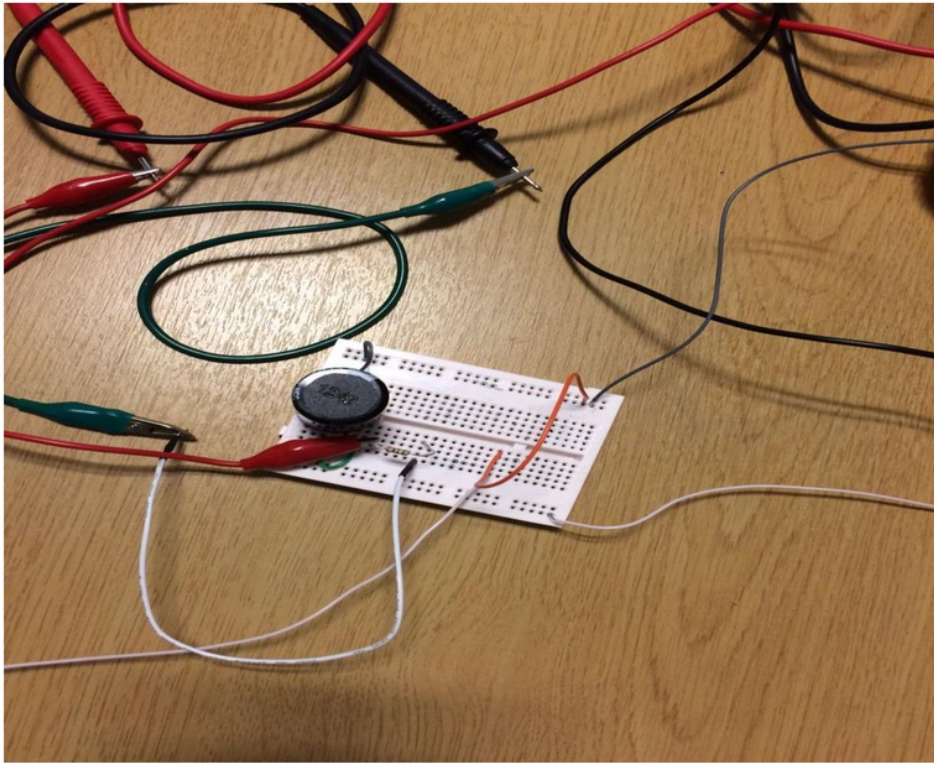
2.3 Practical results.

Next we did the circuit as a practical, we did this as a practical group. When we did the practical, we worked in a team of 3, myself Liam and Mathew, Liam was on the timer and prompting us every 20seconds where I was making note of the voltage and Mathew was taking the current.

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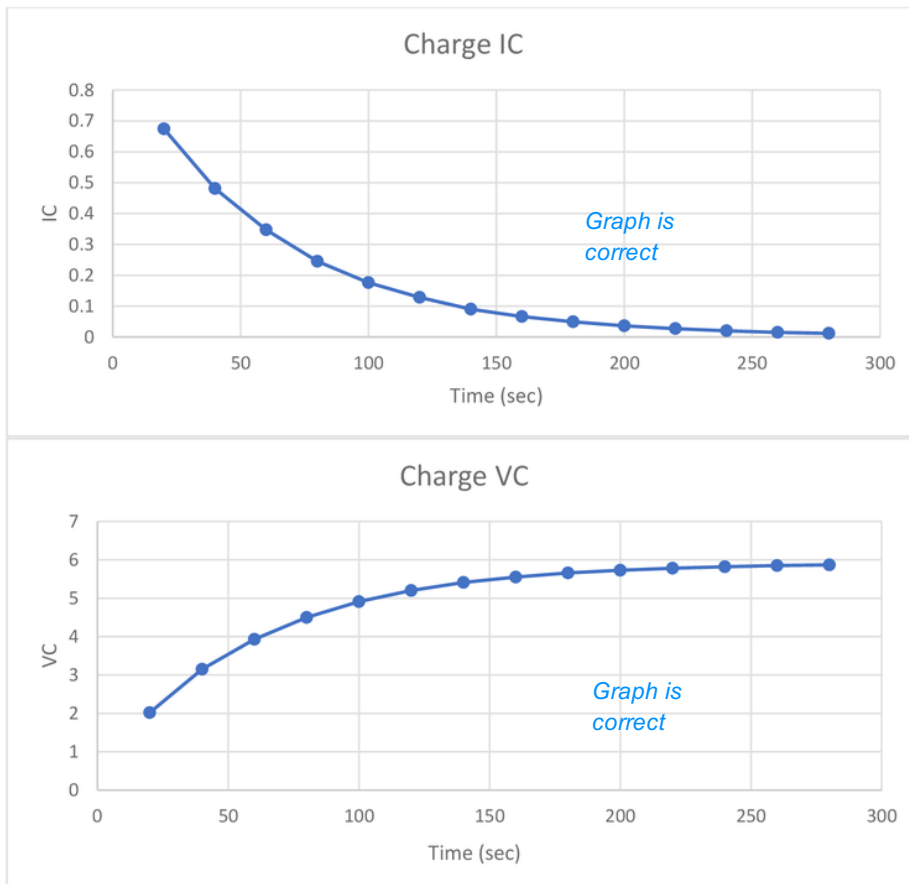
Good use of image t



Above is a drawing and photos of the setup we had. Below is the table of results we had and graphs of the voltage and current.

Practical Charge results for RC circuit		
Time (t) sec	Voltage (VC)	Current (IC)
20	2.02	0.674
40	3.15	0.481
60	3.93	0.347
80	4.50	0.245
100	4.91	0.176
120	5.20	0.128
140	5.41	0.090
160	5.55	0.066
180	5.66	0.049
200	5.73	0.036
220	5.78	0.027
240	5.82	0.020
260	5.85	0.015
280	5.87	0.012

The results are good and are expected. Magnitude of values are not included



*Avoid using first person terms
in any report*

2.4 Simulated Results

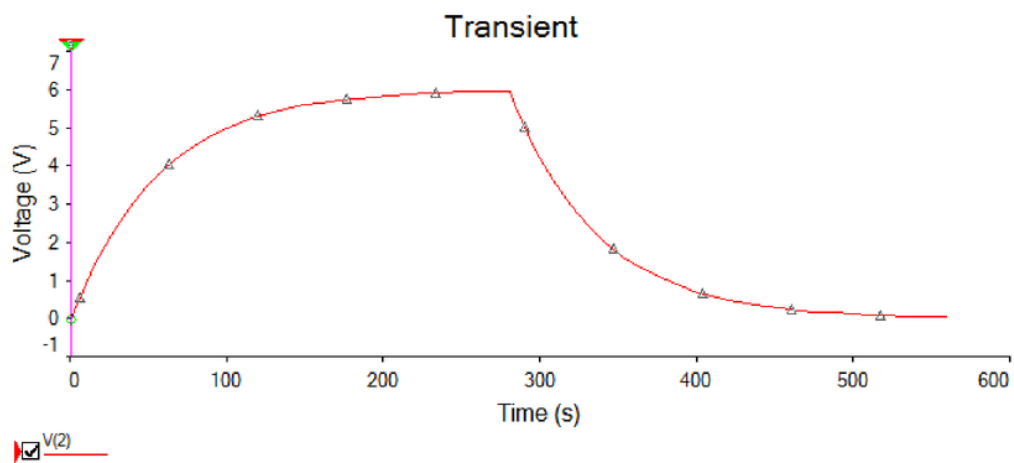
For the simulated results I created the circuit on multisim. Multisim is a simulation and circuit design software for analogue, digital and power electronics. I could use this software to create the circuit, and also take measurements. Below is a table of results I got. (NI.com, 2018)

Simulated charge results for

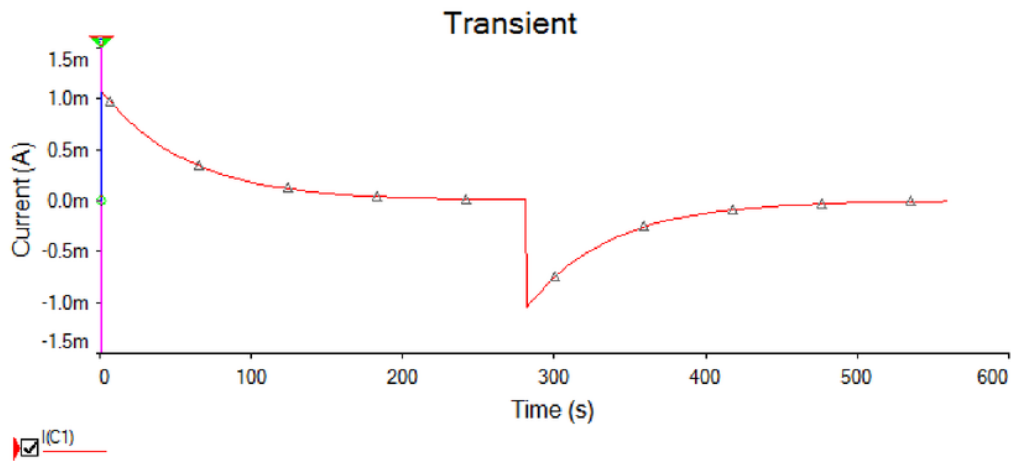
RC circuit		
Time (t)	VC	IC (mA)
20	1.780	0.753
40	3.056	0.525
60	3.948	0.366
80	4.564	0.256
100	4.995	0.179
120	5.297	0.125
140	5.509	0.087
160	5.658	0.060
180	5.760	0.042
200	5.832	0.029
220	5.883	0.020
240	5.918	0.014
260	5.943	0.010
280	5.960	0.007

Good set of results

By using multsim I could also create a graph. Below I have included the voltage graph. As you can see this graph also contains the discharge times, in this task we are only interested in the charge values, but we will come back to the discharge in task 2.



And here is the current graph. Again, we are only concerned with the charge readings for this task

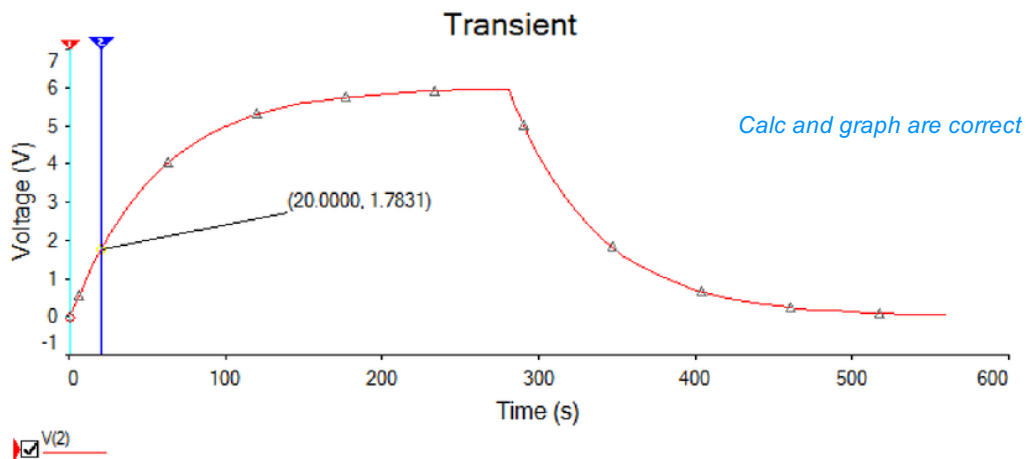


2.5 Comparing results

Now that we have our results for the 3 methods we can make comparisons I will take 3 instantaneous times and compare the voltage and current, and explain and discrepancies.

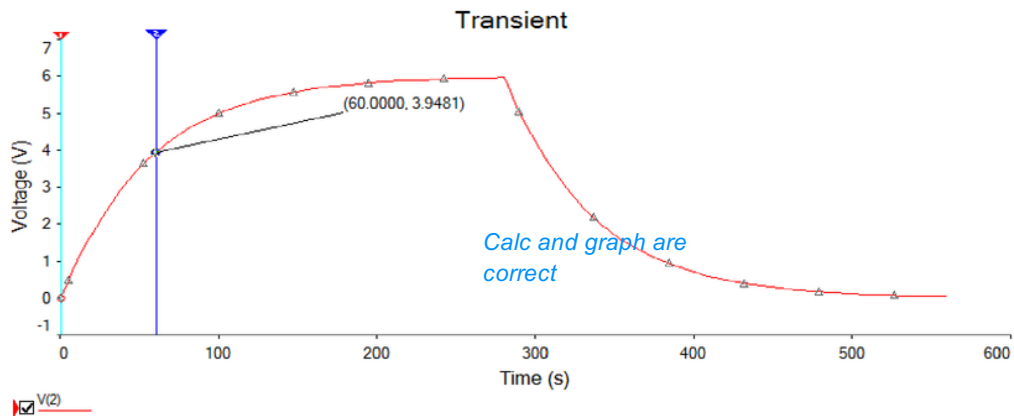
The 3 times I will chose are 20, 60 and 120.

The first time was at 20 seconds. So the VC = $6 (1 - e^{-20/56}) = 1.80$. And as you can see the simulated results for 20 sec is 1.78, with is only 0.02 out.



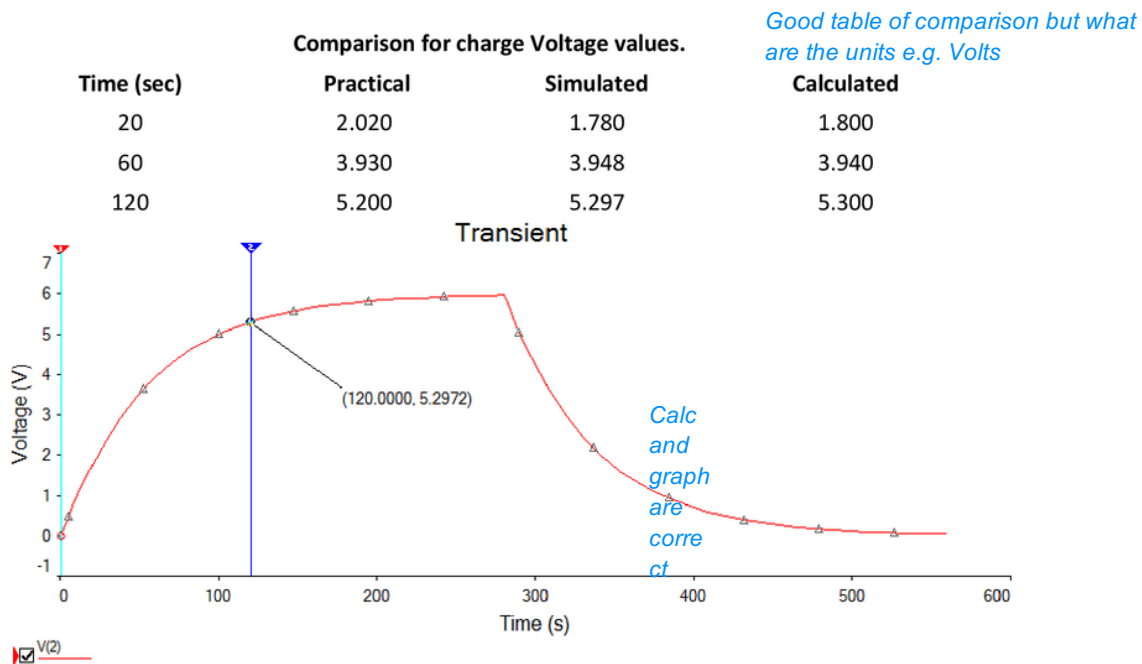
So for VC at 60seconds = $VC = 6(1 - e^{-60/56}) = 3.945$ *Units should be included*

below is the results from multisim. On multisim at 60seconds it was 3.9481. So it's only 0.003 off the calculated value.



The 3rd time value will be at 120. So the VC = $6(1 - e^{-120/56}) = 5.296$. *Units not included*

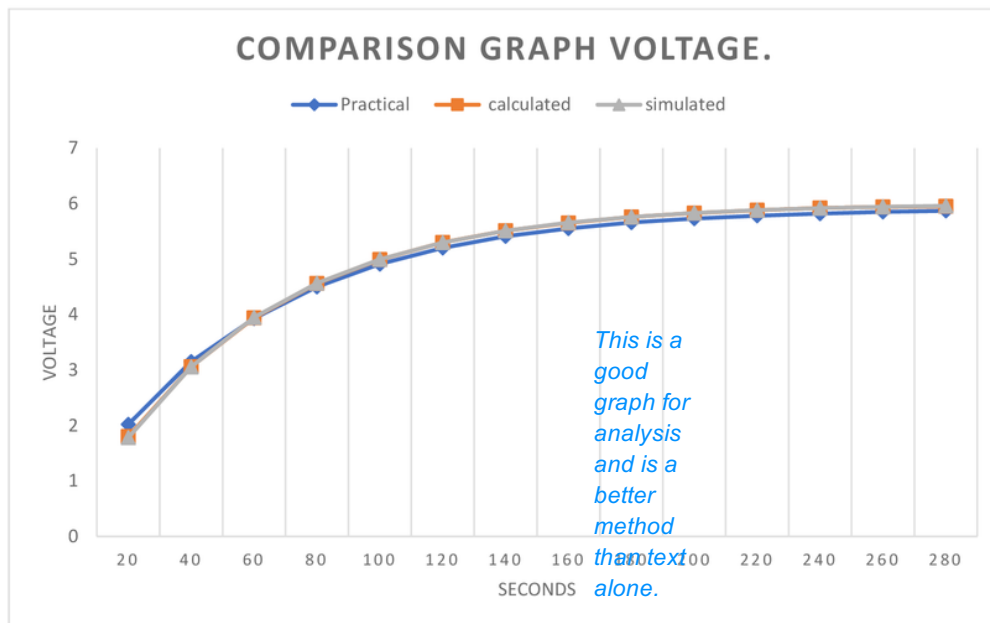
Below is the graph with the results I got from multi sim. Which is only 0.001 away from the calculated value at 5.2972.



I've made this table to compare all 3 methods. The calculated and simulated results are very accurate, there are some discrepancies in the practical results. This could be down a number of variables. One of which is human error, as we had one person timing and one person taking the readings there will be a slight delay. Another variable could be the tolerances of the equipment we used. The multimeters we used for example will not be 100% accurate, and there will be slight resistance in the test leads. Another theory would be that the resistor is not what it is rated at. Ours was rated at 5.6k Ω but there a good chance it wasn't exactly 5.6k, this would affect our results. The same applies for the circuit board and other components such as the capacitor itself.

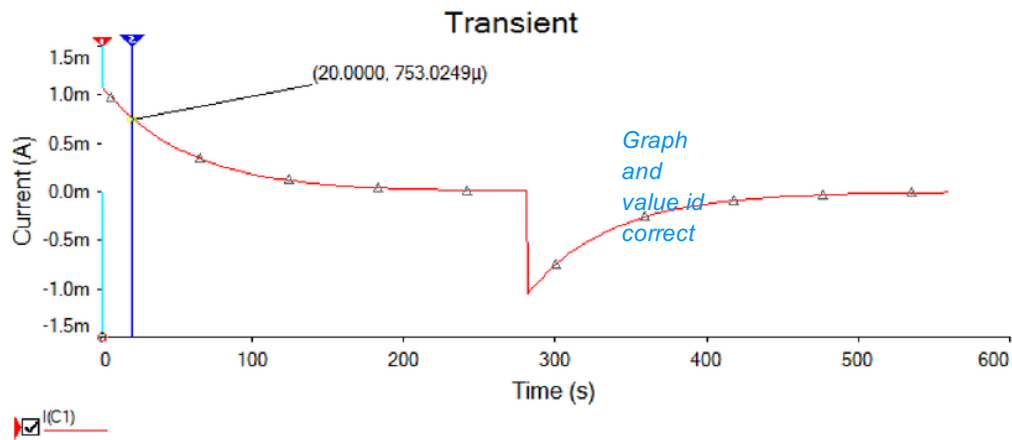
Good arguments for discrepancies

The Tables and graphs could be arranged more efficiently

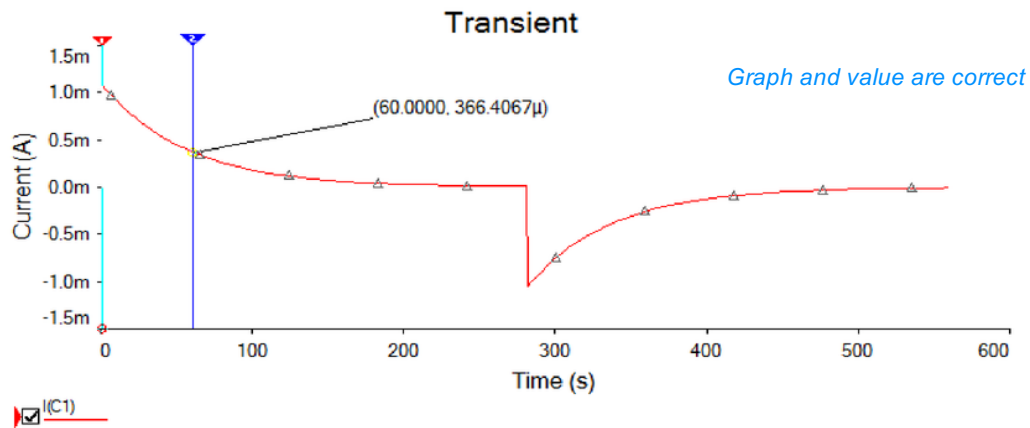


I created this graph which includes all the results at 20 second intervals for the 3 methods. Which illustrates how accurate the results are to each other.

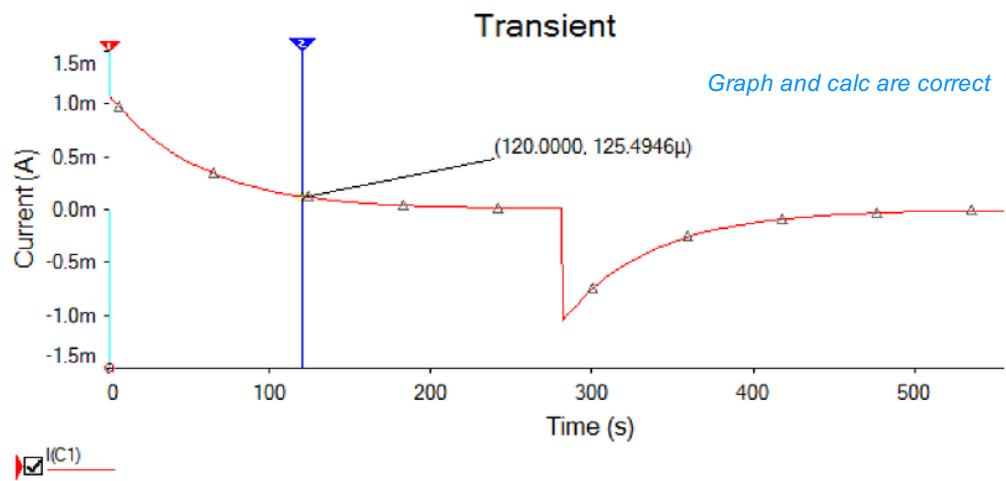
I will now get 3 instantaneous times at current. These will also be at 20sec, 60sec and 120sec. using the formula $IC = I_{max}(e^{-\frac{t}{\tau}})$ I will also use multisim to get simulated result. First time is 20sec so $IC = 6(e^{-\frac{20}{56}}) = 0.749$. On the simulation I got 0.753. Which is only 0.004mA out? For the practical it was 0.674, which is a little more out than the other 2 methods. This could be down to human error when taking readings.



Next time is at 60sec, so using the formula again we can get out calculated result $IC = I_{max}(e^{-\frac{t}{\tau}}) = IC = 6(e^{-\frac{60}{56}}) = 0.366$. Which is exactly the same as simulated value. The practical result is slightly out again, at 0.347, so the 3 methods are only 0.019mA apart.



The third time is at 120sec, so using the formula again we can get out calculated result $IC = I_{max}(e^{-\frac{t}{\tau}}) = IC = 6(e^{-\frac{120}{56}}) = 0.125$. Which is exactly the same as calculated value again. The practical result is slightly out again, at 0.128, so the 3 methods are only 0.003mA apart.



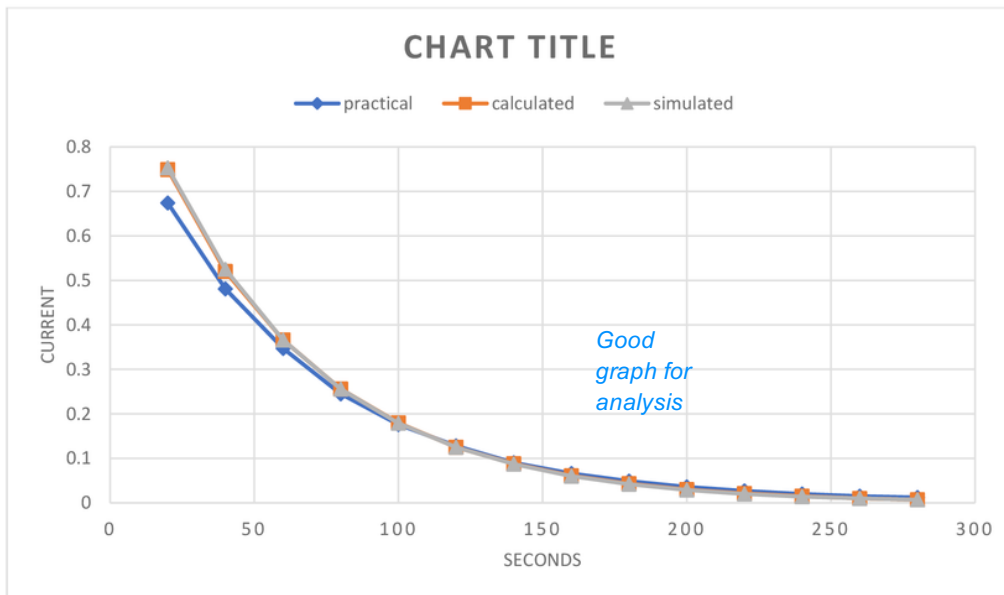
Comparison for charge Current values

Time (sec)	Practical	Simulated	Calculated
20	0.674	0.753	0.749
60	0.347	0.366	0.366
120	0.128	0.125	0.125

These should include the units

First person again here. Avoid this

I have created another comparison table for the current results. The results are fairly accurate and the main discrepancies are with the practical results. This is due to the same reasons as I explained under the voltage results comparison table.



I created this graph which includes all the results at 20 second intervals for the 3 methods. Which illustrates how accurate the results are to each other.

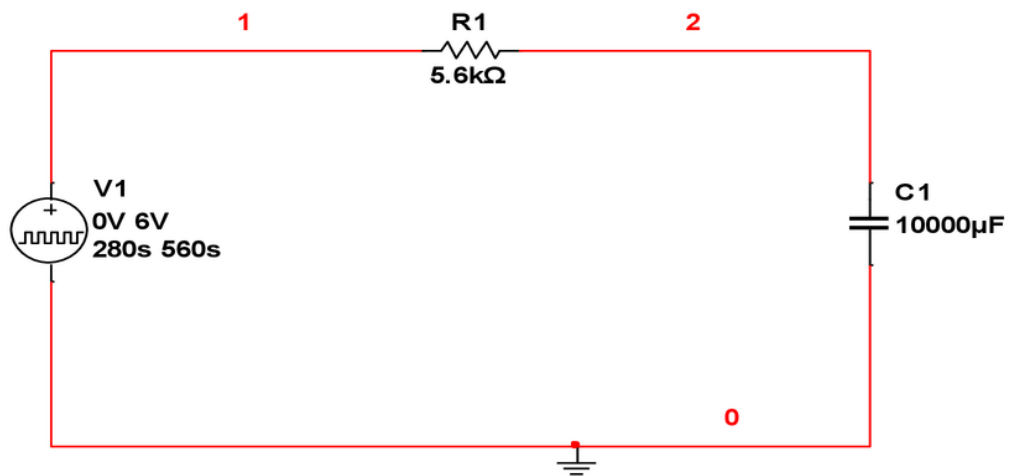
3. Task 2

3.1 Introduction

In this task I will be explaining the transient behaviour of the discharging of a capacitor, we will be using the same circuit we used in task 1. Which I have included again below. If you look at the power supply used in the circuit you will notice we used a pulse train voltage source. This is so we can make the power supply the circuit for 280sec (5T) so that the capacitor fully charges, then the pulse train will change to a negative edge so that the capacitor is discharging between 280 and 560sec, which is also 280 sec. (5T) For the capacitor to be in a discharging condition it must first be fully charged, so it must have had power supply for at least 5T. We carried out a practical exercise on the circuit to take voltage and current readings every 20 seconds while it was discharging.

Avoid first person terms

Good intro to task explaining the test method and masking

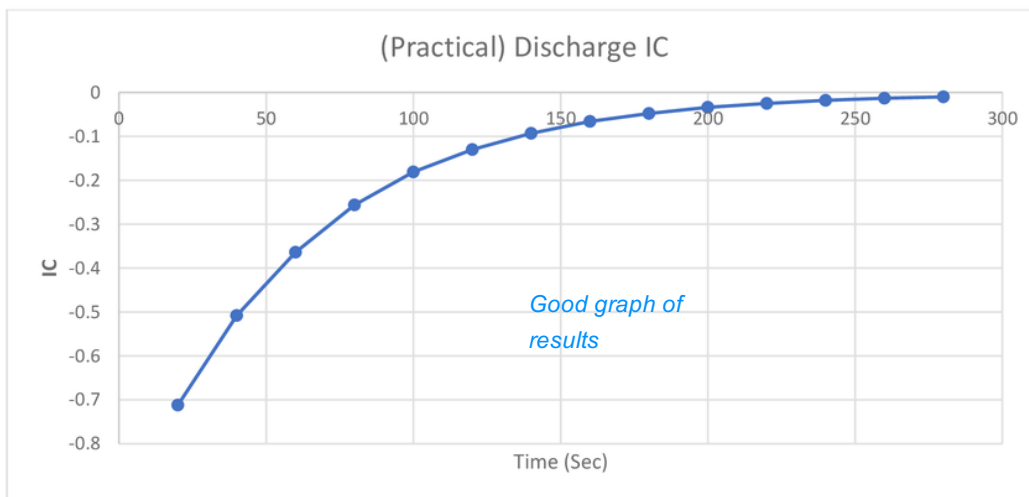
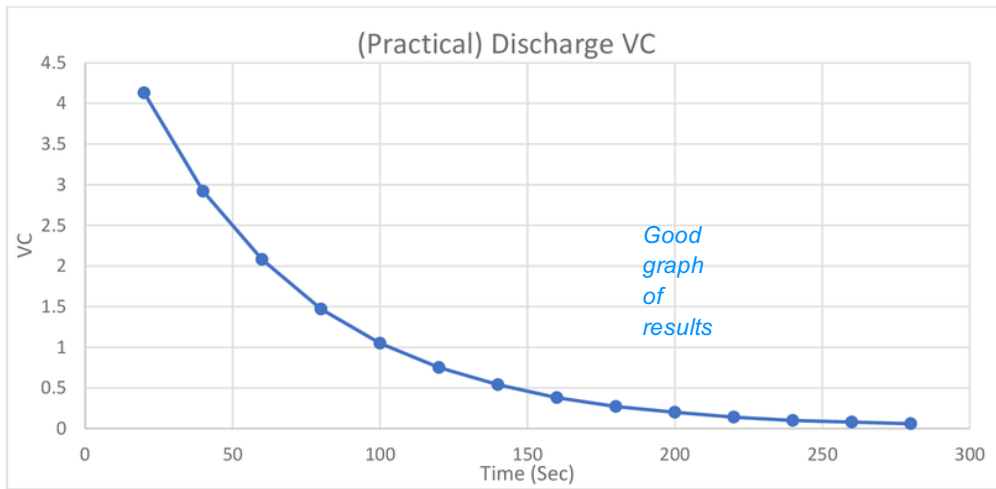


3.2 Practical results

Practical Results for Discharge

Time (t) sec	VC	IC
20	4.13	-0.712
40	2.92	-0.508
60	2.08	-0.364
80	1.47	-0.256
100	1.05	-0.181
120	0.75	-0.130
140	0.54	-0.093
160	0.38	-0.066
180	0.27	-0.048
200	0.20	-0.034
220	0.14	-0.025
240	0.10	-0.018
260	0.08	-0.013
280	0.06	-0.010

The values should include the units e.g. mA



The results for the practical is almost exactly the reverse of the charge results. For the voltage it drops rapidly to begin with then starts to level out just above 0v and with the current discharge it climbs rapidly up and levels out just under 0A.

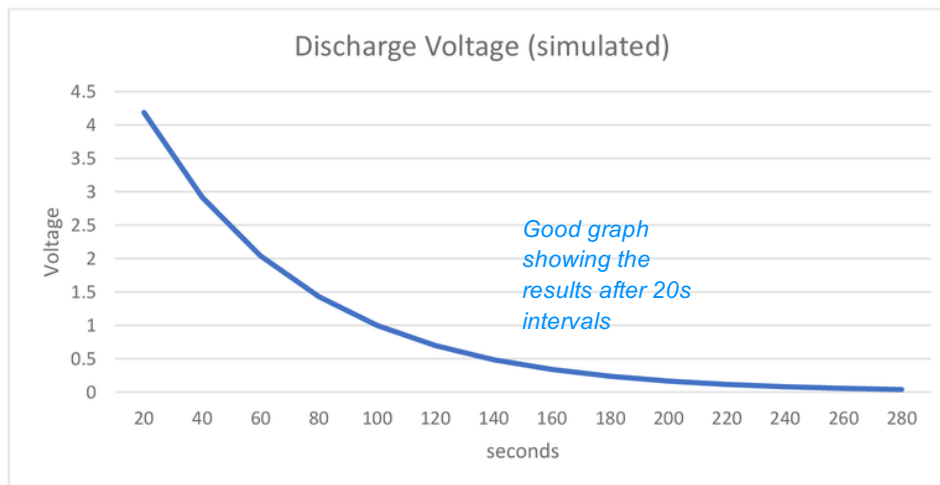
3.3 Simulated results

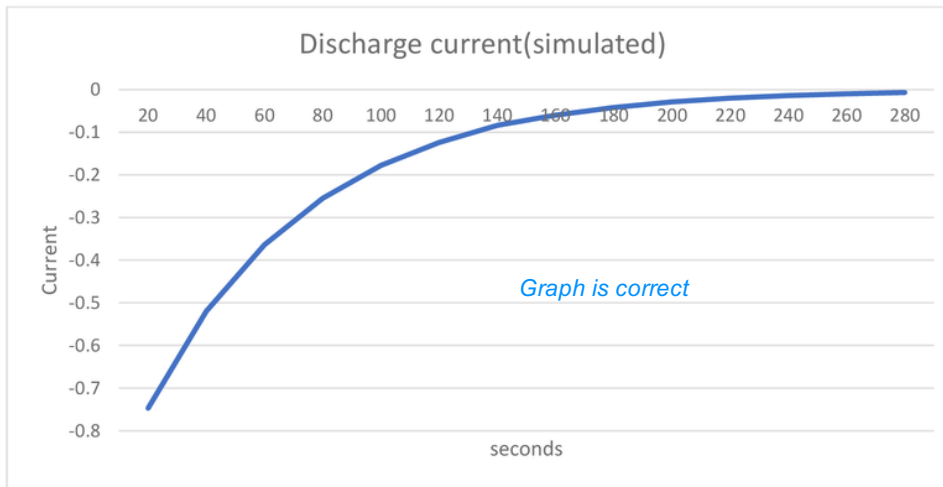
Here are my results using multisim.

Simulated Discharge results for RC circuit

time(t)	VC	IC(mA)
20	4.188	-0.747
40	2.917	-0.520
60	2.041	-0.364
80	1.429	-0.255
100	0.999	-0.178
120	0.697	-0.124
140	0.485	-0.084
160	0.340	-0.060
180	0.238	-0.042
200	0.166	-0.029
220	0.116	-0.020
240	0.081	-0.014
260	0.056	-0.010
280	0.039	-0.007

Sim results are correct



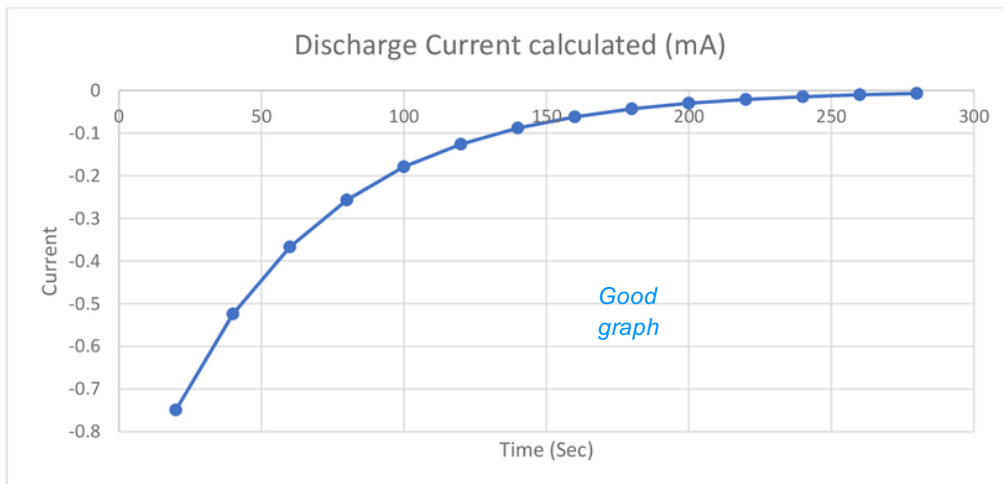
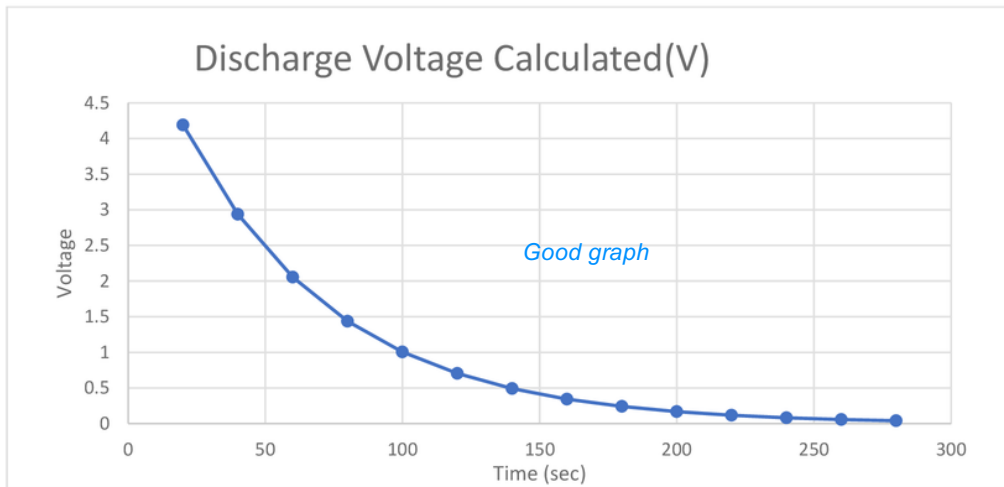


3.4 Calculated results.

Using the formulas $VC = VS(e^{-t/T})$ for Voltage and $IC = -Imax(e^{-\frac{t}{T}})$. Where $Imax = \frac{VS}{R}$ To get current. Below I have included a chart of the results I got.

Calculated results for discharge		
time (sec)	Voltage (V)	Current (mA)
20	4.19	-0.749
40	2.937	-0.524
60	2.055	-0.367
80	1.437	-0.257
100	1.006	-0.179
120	0.704	-0.126
140	0.492	-0.088
160	0.344	-0.062
180	0.241	-0.043
200	0.169	-0.030
220	0.118	-0.021
240	0.082	-0.015
260	0.058	-0.010
280	0.040	-0.007

3 samples would have been sufficient to prove the theory



3.5 Comparing 3 instantaneous times.

I will now compare 3 instantaneous times and compare results from my calculated, simulated and practical results and I will try and explain any discrepancies. The 3 times I have chosen are 20, 60 and 120seconds.

Comparison for discharge Voltage values.

Time (sec)	Practical	Simulated	Calculated
20	4.130	4.188	4.190
60	2.080	2.041	2.055
120	0.750	0.697	0.704

*Results in table
should include units
e.g. Volts*

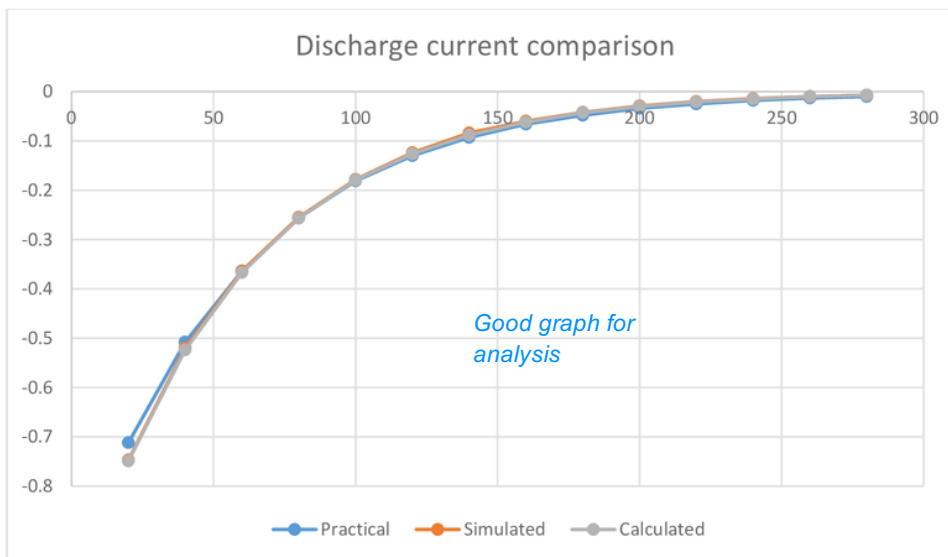
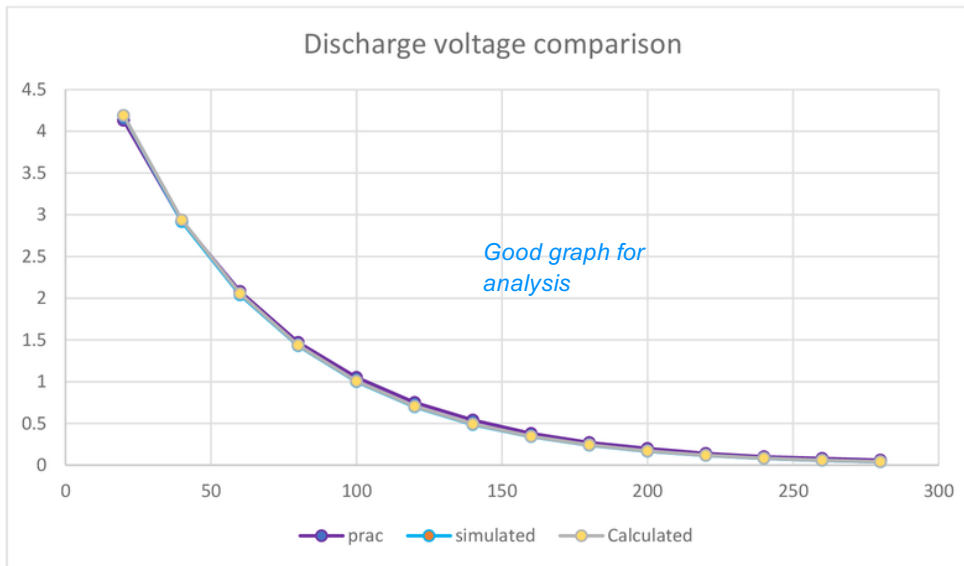
Comparison for discharge Current values

Time (sec)	Practical	Simulated	Calculated
20	-0.712	-0.747	-0.749
60	-0.364	-0.364	-0.367
120	-0.130	-0.124	-0.126

*Results should
include units
e.g. mA*

The results from the 3 methods are very similar, the slight discrepancies are with the practical results. This could be because of human error, not taking the readings at the exact time. Or could be down to the component tolerances.

*Fair argument
but what sort of
tolerances*

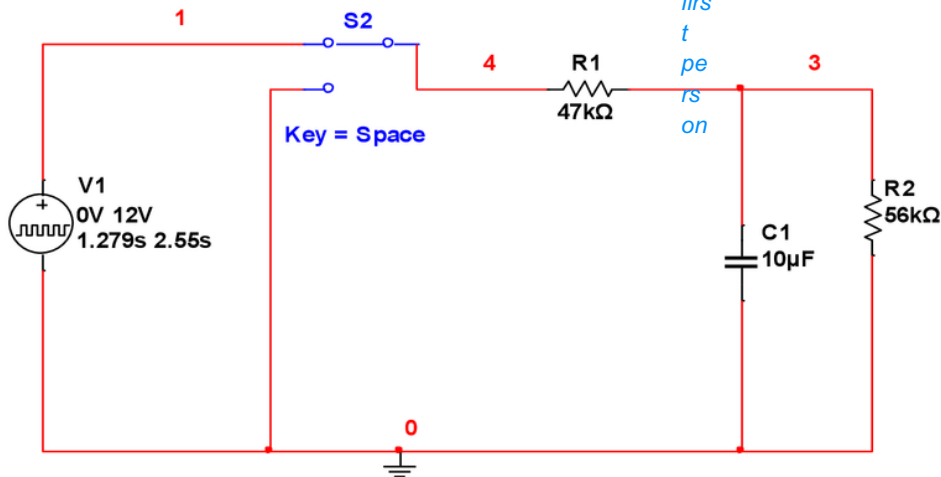


4. Task 3.

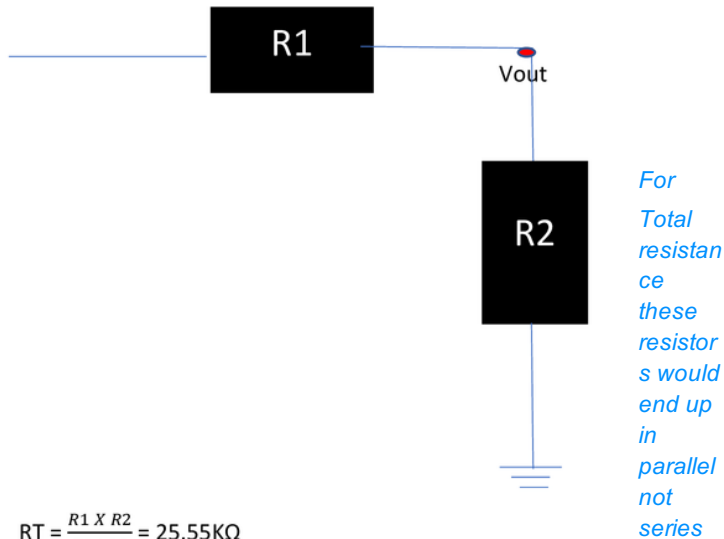
This task contains work that was not necessary e.g. many calcs of samples that are not needed

4.1 Background Information

In this task I will be looking at a transient behaviour of a complex circuit. Below is the circuit I will be analysing.



First I will need to make an equivalent circuit. So I can get a total resistance (R_T). I will do this by removing the capacitor then removing the power supply so I will end up with something like this



$$R_T = \frac{R_1 \times R_2}{R_1 + R_2} = 25.55\text{K}\Omega$$

$$V_{out} = V_S \times \frac{R_2}{R_1 + R_2} = 6.52\text{V}$$

$$\text{Time constant} = T = RC = 25.55\text{K}\Omega \times 10\mu\text{F} = 0.2555\text{seconds.}$$

Transient period. = $5T = 1.279\text{sec}$

Good point made here. Why is R4 not included initially

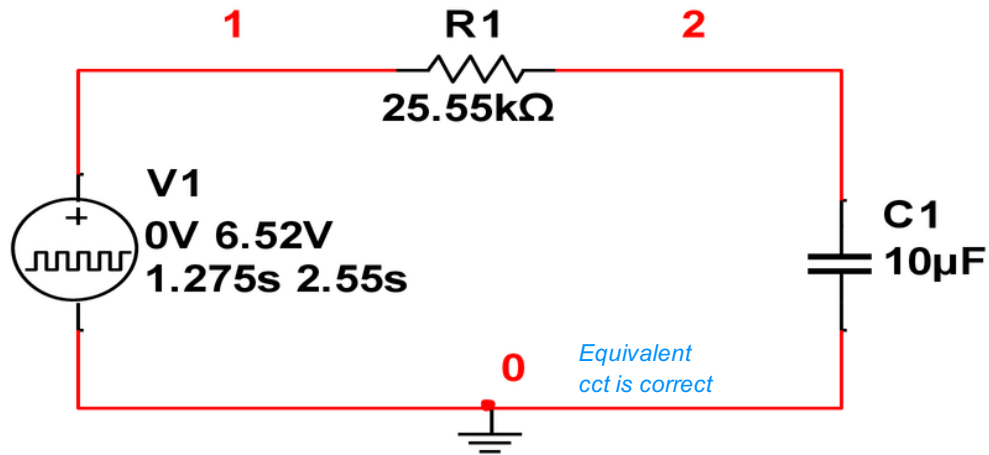
Initial current = $I_{\text{max}} = \frac{V}{R1} = 0.255\text{Ma}$ R2 not in initial current as C1 acts as a short circuit.

Final current for the circuit. = $I_{\text{max}} = \frac{V}{R1+R2} = \frac{12}{47000 + 56000} = 0.004\text{a}$

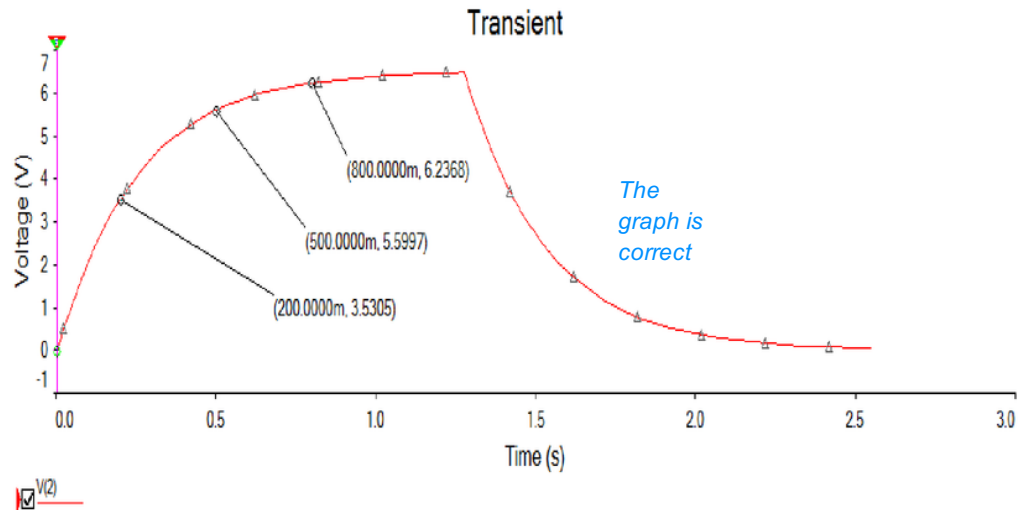
This should be 116uA

Now that I have these new figures, I can make the equivalent circuit on multisim. Below is the circuit.

4.2 Simulated Circuit



Using multisim I have got 3 voltage readings at instantaneous time. Below I have included them in the graph



4.3 Charge conditions

I will now do some equations to get the calculated values and see how they compare to the simulated results. We were unable to do a practical in this task as the times were so small that we would not be able to get accurate readings.

First I will do 3 for the charge voltage

Here is the formula I will need to use. $VC = Vmax (1 - e^{-\frac{t}{T}})$

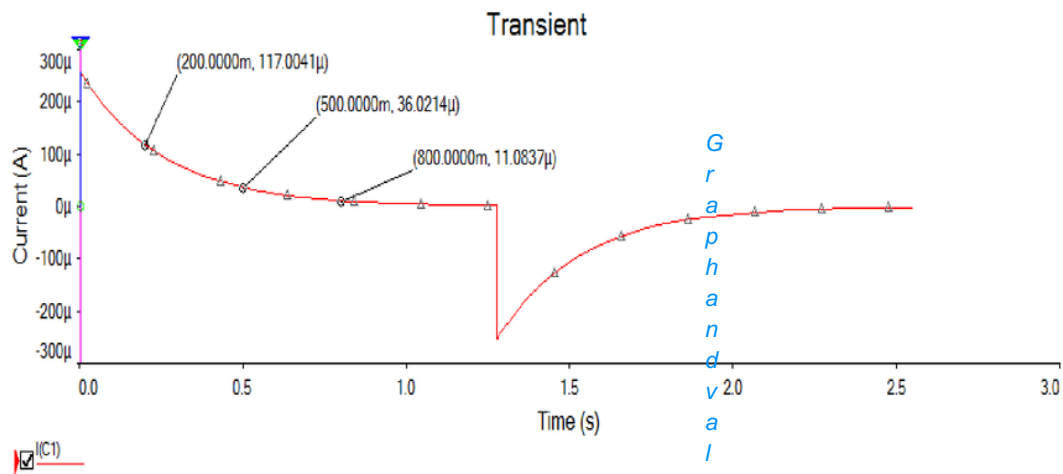
TIME (millisecond)	EQUATION	RESULT	SIMULATED
200	$VC = 6.52 (1 - e^{-\frac{200}{0.255}})$	3.544	3.5305
500	$VC = 6.52 (1 - e^{-\frac{500}{0.255}})$	5.602	5.5997
800	$VC = 6.52 (1 - e^{-\frac{800}{0.255}})$	6.237	6.2368

Results should include units e.g. volts

Avoid first person

Next I will do 3 current readings for charge. I will use the same times as for voltage.

Here is the formula I will use $IC = Imax(e^{-\frac{t}{T}})$



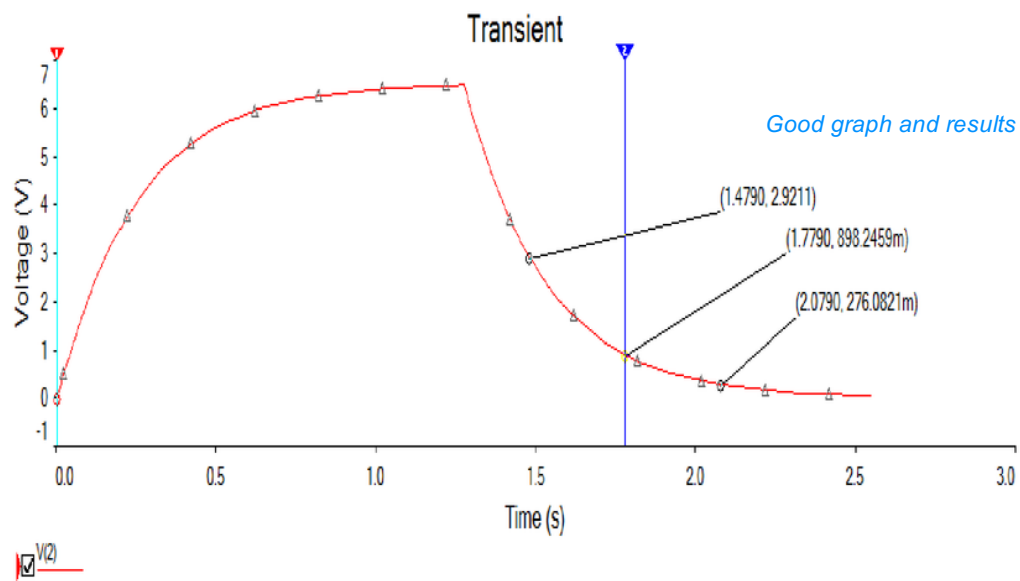
TIME (millisecond)	EQUATION	RESULT	SIMULATED
200	$IC = 0.255 \times 10^{-3} (e^{\frac{-0.2}{0.255}})$	116.569u	117.004u <i>uA</i>
500	$IC = 0.255 \times 10^{-3} (e^{\frac{-0.5}{0.255}})$	36.029u	36.0214u <i>uA</i>
800	$IC = 0.255 \times 10^{-3} (e^{\frac{-0.8}{0.255}})$	11.135u	11.083u <i>uA</i>

4.4 Discharge Conditions

Now I will do the same for the discharge readings.

Here is the formula I will need to use. $VC = -Vmax (e^{\frac{t}{\tau}})$

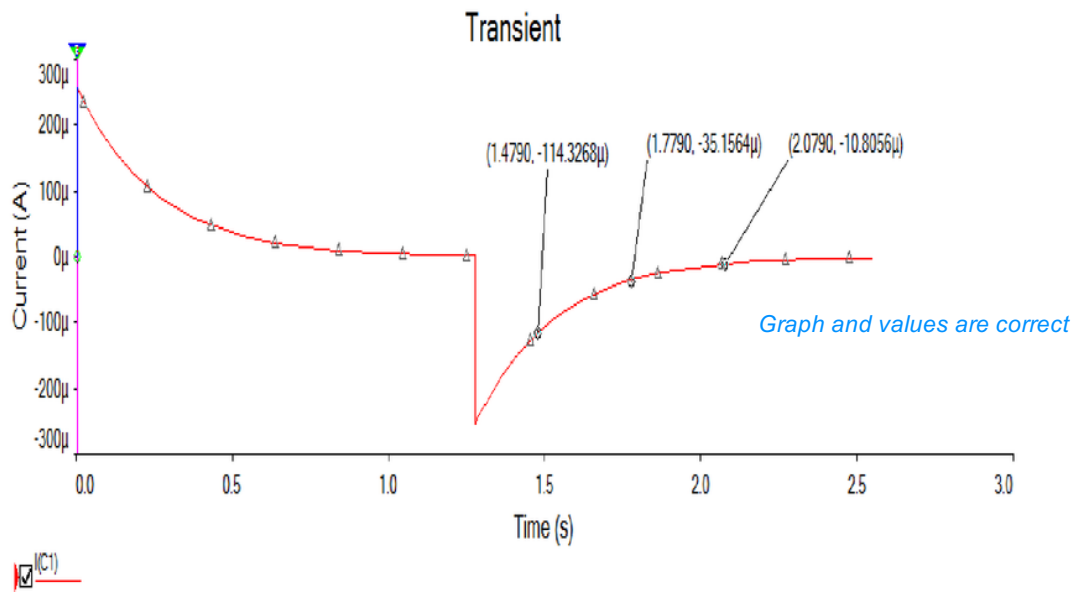
Here are my results for voltage



TIME (millisecond)	EQUATION	RESULT	SIMULATED
200	$VC = -6.52 (e^{\frac{-0.2}{0.255}})$	2.975	2.9211
500	$VC = -6.52 (e^{\frac{-0.5}{0.255}})$	0.917	0.8982
800	$VC = -6.52 (e^{\frac{-0.8}{0.255}})$	0.282	0.2760

Should include the units for the values

Here is the results for the current at discharge. Using the formula $IC = -Imax(e^{\frac{-t}{\tau}})$



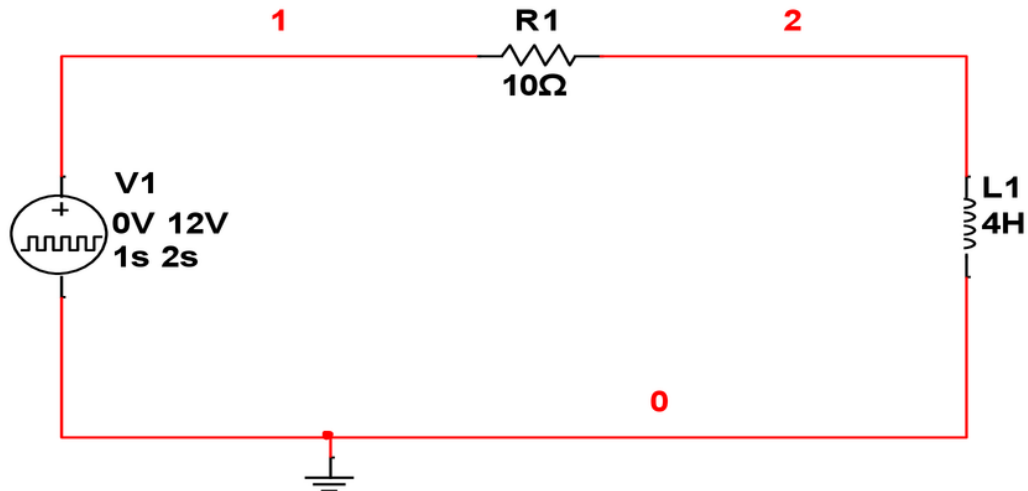
TIME (millisecond)	EQUATION	RESULT	SIMULATED
200	$IC = -0.255 \times 10^{-3} (e^{\frac{-0.2}{0.255}})$	-116.3903	-114.3268uA
500	$IC = -0.255 \times 10^{-3} (e^{\frac{-0.5}{0.255}})$	-35.8907	-35.1564uA
800	$IC = -0.255 \times 10^{-3} (e^{\frac{-0.8}{0.255}})$	-11.0674	-10.8056uA

As you can see all my results are pretty accurate, any discrepancies will be down to rounding off of equations.

5. Task 4.

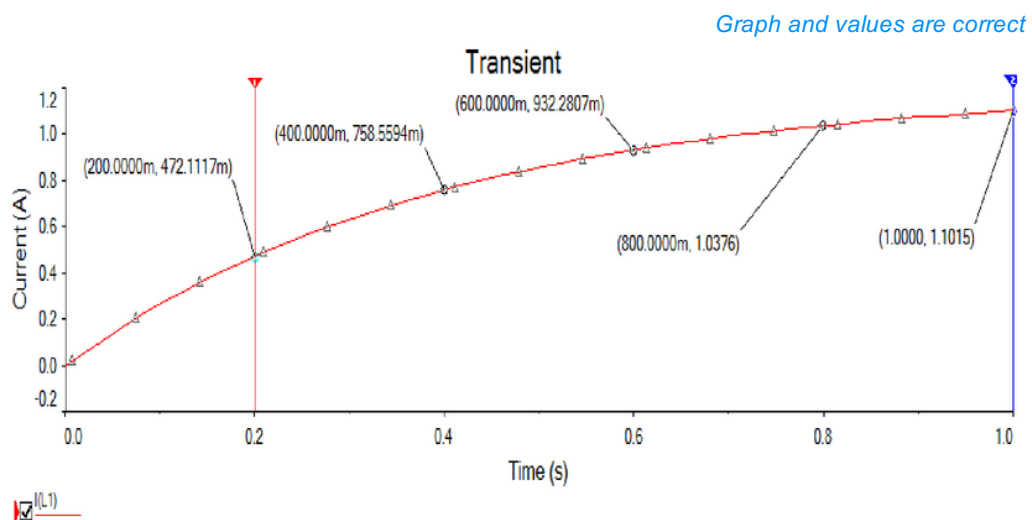
Transient Behaviour for the inductive circuit.

Here is the circuit that will be examined for Task 4.



5.1 Current Growth in first 1 second

Using NI multisim I will capture and simulate the current growth for the first second after voltage is applied to the circuit.



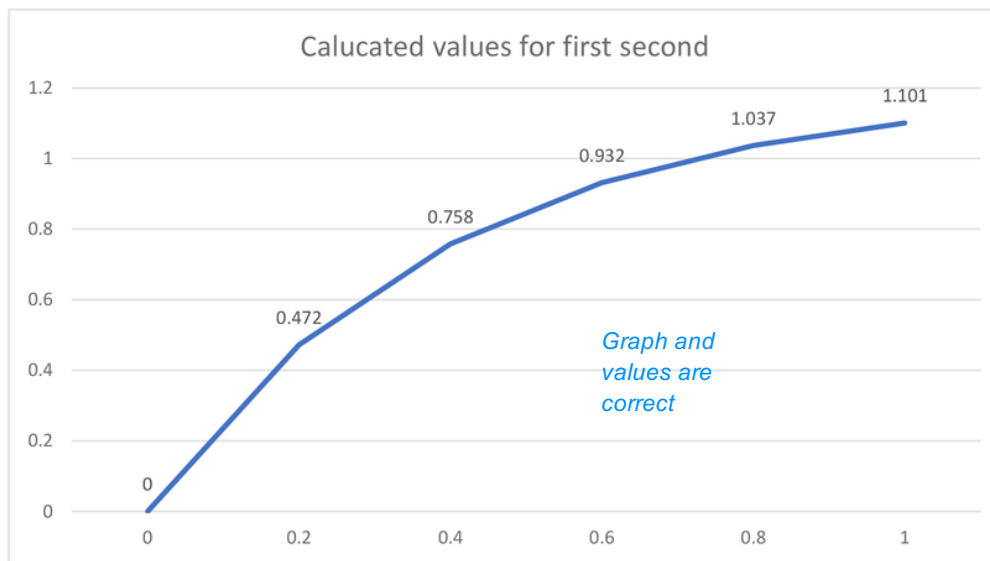
5.2 Calculated Current Growth in first second

Here is a table of the calculated results for the first second

Time	Equation	Result
0.2	$1.2(1 - e^{\frac{-10}{4}0.2})$	0.4721
0.4	$1.2(1 - e^{\frac{-10}{4}0.4})$	0.758
0.6	$1.2(1 - e^{\frac{-10}{4}0.6})$	0.932
0.8	$1.2(1 - e^{\frac{-10}{4}0.8})$	1.037
1.0	$1.2(1 - e^{\frac{-10}{4}1.0})$	1.101

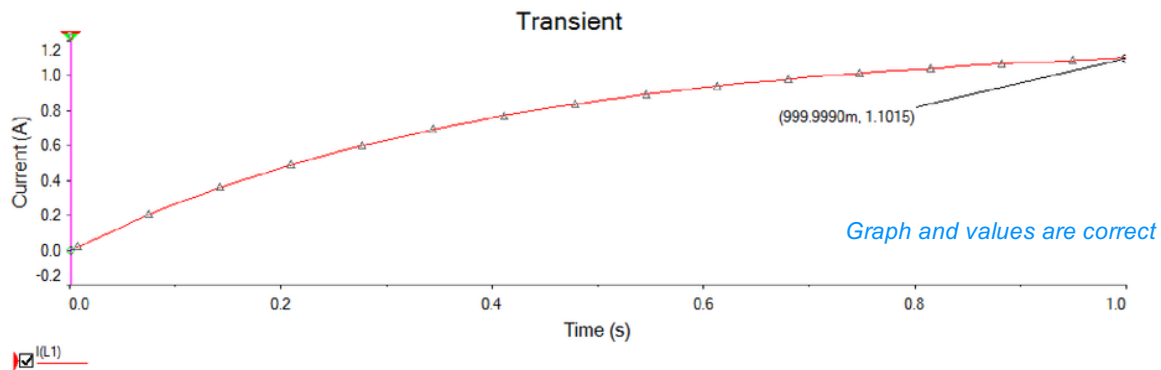
*Values should include units e.g.
Amps*

Here is the results in a graph form. As you can see it is nearly identical to the simulated graph.



5.3 Current flow in circuit immediately before switched over.

To determine the current flowing into the circuit immediately before the switch is changed over I used NI Multisim and set the X value to 999.9999m seconds. And the reading shows 1.1015A



5.4 Calculated time constants

Next I will determine the time elapsed when the circuit current has fallen to:

- i) 100mA
- ii) 10mA

$$T = L/R = 4/10 = 0.4\text{sec}$$

$$I_{\text{max}} = V/R = 12/10 = 1.2$$

$$I_L = I_{\text{max}} (e^{(-R/L \cdot t)})$$

Need to re arrange to find t.

$$I_L/I_{\text{max}} = e^{(-r/l \cdot t)}$$

Use log rule to take out e. put log on both sides.

$$\ln(I_L/I_{\text{max}}) = \ln(e^{(-r/l \cdot t)})$$

$$\ln(I_L/I_{\text{max}}) = -R/L \cdot t. \quad T=L/R \text{ SO } 1/T = R/L$$

$$\ln = (I_L/I_{\text{max}}) = -t/T$$

$$t = T (\ln(I_L/I_{\text{max}}))$$

$$\text{So for i) } 100\text{mA} = t = 0.4 (\ln(0.1/1.2)) = \mathbf{0.993}$$

$$\text{And for ii) } 10\text{mA} = 0.4 (\ln(0.01/1.2)) = \mathbf{-1.914}$$

Calcs are incorrect here because the wrong value I_{max} is used. Should be

6. Conclusion and recommendations

6.1 Conclusion

First person
should not be
used.

The objection of this assignment was to get introduced to RL and RC series circuit analysis. I have gained good knowledge of these circuits and can now use mathematic formulae to carry out circuit analysis. I can also create circuits using NI Multisim and carry out simulated analysis. I can compare my results from different methods, calculated, simulated and practical methods. I have done research and can explain any discrepancies of the results and suggest what could affect this.

I can annotate and interpret information from simulated and use data appropriately with a range of scientific principles. I demonstrated good team working as when we did the Practical circuit we worked as a team to gather all the information needed. I can take instrument readings from practical circuits, collect and use data. We proved our Readings were fairly accurate when we compared to the calculated and simulated readings.

Conclusion
should be
better and

6.2 Recommendations

I would recommend adding more practical elements. When we did the practical, I learned more as I could see the physical components and can get a better understanding, I find this a lot better than simulated circuits and calculating values.

more results
focused
rather than
what actions
This
you carried
out
should be
better.

Your
personal
opinions
are not what
is needed

7. Bibliography

Aspen-core. (2018). www.electronics-tutorials.ws.

Bird, j. (2017). *Electrical and electronic principles and technology*. 6th edn. Addington: routledge.

NI.com. (2018). <http://www.ni.com>. Retrieved from National instruments.

Nilsson, J. W. (2015). *Electric Circuits*. Harlow Essex: Pearson Education Limited.

PSDE4001 Principles. Assignment 1.

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

Instructor

61 / 100

PAGE 1

PAGE 2

PAGE 3

Text Comment. No first person terms should be used in any HE report.

Text Comment. The intro is informative but the grammar is poor

Text Comment. Good test methods identified

PAGE 4

Text Comment. The image explains the transients but the explanation could be better

Text Comment. Significant points and the test method is identified here

PAGE 5

Text Comment. Units should be included

Text Comment. Only 3 instantaneous times were needed

PAGE 6

Text Comment. Graph is correct

Text Comment. Graph is correct

Text Comment. No need to mention the parties involved in the practical. All that is needed

is an explanation of the results.

PAGE 7

Text Comment. Good use of image to enhance the practical test

PAGE 8

Text Comment. The results are good and are expected. Magnitude of values are not included

PAGE 9

Text Comment. Graph is correct

Text Comment. Graph is correct

Text Comment. Avoid using first person terms in any report

PAGE 10

Text Comment. Good set of results

PAGE 11

Text Comment. Calc and graph are correct

PAGE 12

Text Comment. Units should be included

Text Comment. Calc and graph are correct

Text Comment. Units not included

PAGE 13

Text Comment. Good table of comparison but what are the units e.g. Volts

Text Comment. Calc and graph are correct

Text Comment. Good arguments for discrepancies

Text Comment. The Tables and graphs could be arranged more efficiently

PAGE 14

Text Comment. This is a good graph for analysis and is a better method than text alone.

PAGE 15

Text Comment. Graph and value id correct

Text Comment. Graph and value are correct

PAGE 16

Text Comment. Graph and calc are correct

Text Comment. These should include the units

PAGE 17

Text Comment. First person again here. Avoid this

Text Comment. Good graph for analysis

Text Comment. Avoid first person terms

Text Comment. Good intro to task explaining the test method and masking

PAGE 18

Text Comment. The values should include the units e.g. mA

PAGE 19

Text Comment. Good graph of results

Text Comment. Good graph of results

PAGE 20

Text Comment. Sim results are correct

Text Comment. Good graph showing the results after 20s intervals

PAGE 21

Text Comment. Graph is correct

Text Comment. 3 samples would have been sufficient to prove the theory

PAGE 22

Text Comment. Good graph

Text Comment. Good graph

PAGE 23

Text Comment. Results in table should include units e.g. Volts

Text Comment. Results should include units e.g. mA

Text Comment. Fair argument but what sort of tolerences

PAGE 24

Text Comment. Good graph for analysis

Text Comment. Good graph for analysis

Text Comment. This task contains work that was not necessary e.g. many calcs of samples that are not needed

PAGE 25

Text Comment. Avoid first person

Text Comment. For Total resistance these resistors would end up in parallel not series

Text Comment. These calcs are correct and are the parameters needed for the equivalent circuit

Text Comment. This can be rounded of to 2 decimal places

Text Comment. Good point made here. Why is R4 not included initially

Text Comment. This should be 116uA

Text Comment. Equivalent cct is correct

Text Comment. The graph is correct

Text Comment. Results should include units e.g. volts

Text Comment. Avoid first person

Text Comment. Graph and values are correct

Text Comment. uA

Text Comment. uA

Text Comment. uA

Text Comment. Good graph and results

Text Comment. Should include the units for the values

Text Comment. Graph and values are correct

Text Comment. A

Text Comment. A

Text Comment. A

Text Comment. Graph and values are correct

Text Comment. Values should include units e.g. Amps

Text Comment. Graph and values are correct

Text Comment. Graph and values are correct

Text Comment. Calcs are incorrect here because the wrong value I_{max} is used. Should be $12/10 = 1.2A$

Text Comment. First person should not be used

Text Comment. Conclusion should be better and more results focused rather than what actions you carried out

Text Comment. This should be better. Your personal opinions are not what is needed here

GRADING FORM: CSG-RUBIC

ALUN GEALY

0

RESEARCH-INFORMED LITERATURE



N/a

KNOWLEDGE AND UNDERSTANDING



Intro to practical and assessment should not be in the first person but there are good points. 5/10
Results were good but the discussion was in first person and focussed on what you did next rather than test and methods. 10/15

15/25

ANALYSIS



Testing was carried out with explanations and good methods used. Explanations could be better and in the third person. There are some errors and some values are not identified with units. Task 4 has calculation errors due to I_{max} error. 19/30 The conclusions could be better but there are good points made. 5/10

24/40

PRACTICAL APPLICATION AND DEP.



Circuit testing was carried out competently and results were obtained effectively. Task 4 calcs were incorrect due to incorrect value of I_{max} . The explanations let the analysis down. 10/15 The quality of the results very good and included poor explanations mostly written in the first person. There are some innovative methods used to aid the analysis. 6/10

16/25

SKILLS FOR PROFESSIONAL PRAC.



The quality of the report could have been better if the contents were in a more effective order. 6/10

6/10