HND Electrical/Electronic engineering

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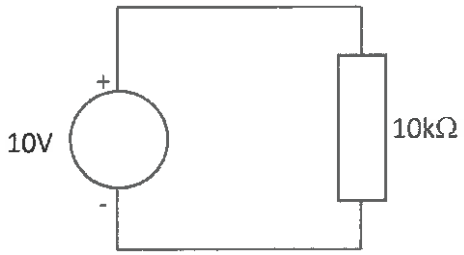
Module: Instrumentation Engineering & Power Systems Engineering

Module code:

Assignment 1

Step 1

MAKE - the following circuit:



Step 2

MEASURE using a multimeter:

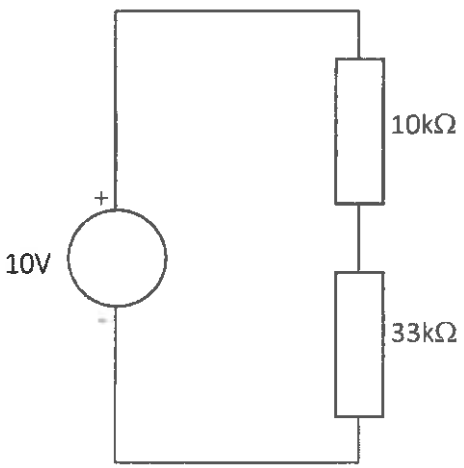
Supply Voltage = ___10V_____

Total Resistance = ___10K_____ close.

Current= ___1.003mA_____

Step 3

CONNECT:



MEASURE using a multimeter the circuit current.

RECORD your observation:

Measured Current = ___0.235mA_____ ✓

CONFIRM that the calculated and measured circuit current agree.

Step 4

CALCULATE the Voltage across each resistor.

RECORD your observations:

Voltage across 10kΩ resistor = ___2.35V_____

Voltage across 33kΩ resistor = __7.765V_____

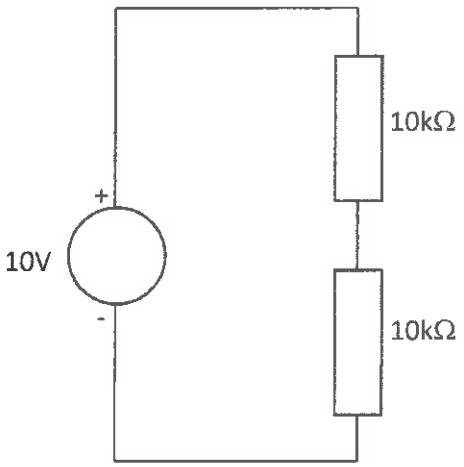
Supply Voltage = ___10V_____ ✓

Show calculations

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Step 5

MAKE:



Step 6a

DEDUCE, without measurement, the voltages across each resistor.

RECORD your deduction:

Voltage across the top resistor = ___5V_____

Voltage across the bottom resistor= ___5V_____

Step 6b

Measure the voltages across each resistor.

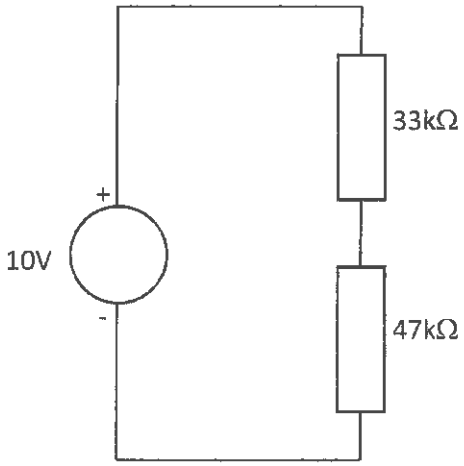
RECORD your measurement:

Voltage across the top resistor = ___4.98V_____

Voltage across the bottom resistor= ___4.99V_____

Step 7

MAKE:



Step 8

Calculate

Voltage across 33kΩ resistor = I_{total} x R_1 = 0.000125 x 33000 = 4.125V

Voltage across 47kΩ resistor = I_{total} x R_2 = 0.000125 x 47000 = 5.875V

Voltage across 33kΩ resistor = ___4.125V_____

Voltage across 47kΩ resistor = ___5.875V_____

MEASURE the resistor voltages.

RECORD your observations:

Voltage across 33kΩ resistor = ___4.12V_____

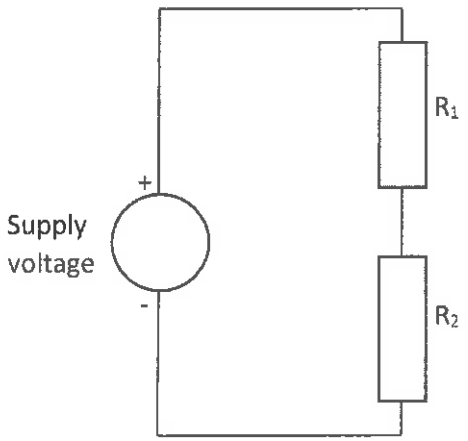
Voltage across 47kΩ resistor = __5.85V_____

CONFIRM that your calculations and the measurements agree.

/ SDP

Step 9

CONSIDER the following circuit diagram:



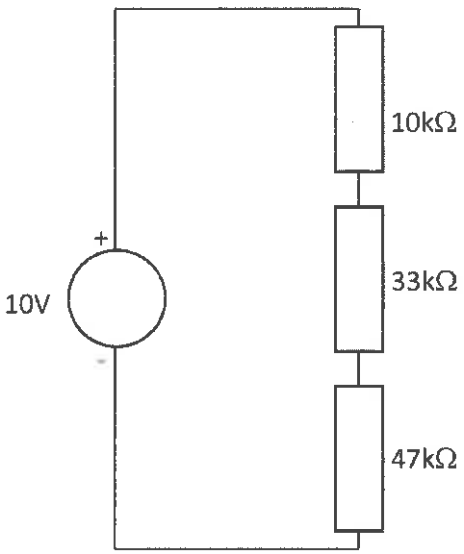
From what you have learnt about Potential Division, whereby a Supply Voltage will divide between resistances according to what proportion of the total resistance each resistor has, complete the following formulae:

Voltage across R_1 = $Supply\ Voltage \times \frac{R1}{R1+R2}$

Voltage across R_2 = $Supply\ Voltage \times \frac{R2}{R1+R2}$

Step 10

MAKE:



Step 11

Measure:

Voltage across 10kΩ = __1.11V_____

Voltage across 33kΩ = ___3.65V_____

Voltage across 47kΩ = ___5.21V_____

CONFIRM measurements by calculation.

Current (I_{total}) = V/Rt = 10/90000 = 0.0001A

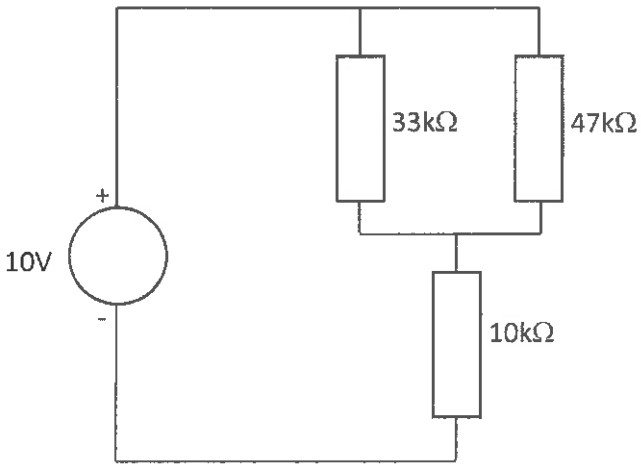
Voltage across 10kΩ = I x R = 0.0001 x 10000 = 1.10V

Voltage across 33kΩ = I x R = 0.0001 x 33000 = 3.66V

Voltage across 47kΩ = I x R = 0.0001 x 47000 = 5.217V

Step 12

MAKE:



Step 13

Calculate the voltage across the 10kΩ resistor and the voltage across the 47kΩ/33kΩ parallel combination.

RECORD your calculations:

Voltage across 10kΩ = 0.00034 x 1000 =__3.4V_____

Voltage across parallel combination = 0.00034 x 10000 ___6.6V_____

CONFIRM your calculations by measurement.

Measured

Voltage across 10kΩ = 3.38V

Voltage across parallel combination = 6.59V

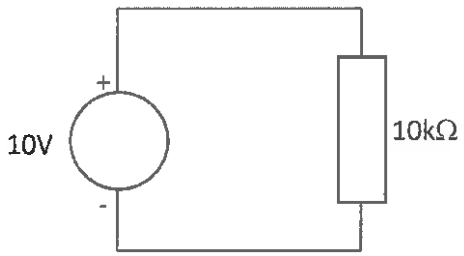
Lab 1b - Current Division

Objective

On completion of this work the student will be able to use the concept of Current Division in determining the currents in 2 branch Parallel circuits.

Step 1

MAKE the following circuit:



CALCULATE, using Ohm's Law, the current in the circuit.

RECORD your observations:

Calculated current = V/R = 10/10000 = 0.001A

Calculated Current=__1mA_____

Step 2

MEASURE, using a multimeter the circuit current.

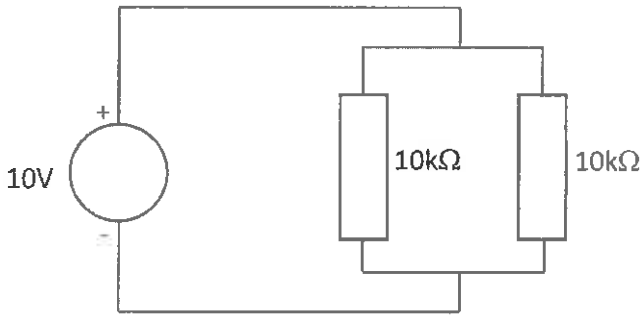
RECORD your observation:

Measured Current = ___1.008mA_____

CONFIRM that the calculated and measured values of circuit current agree.

Step 4

MAKE:



Step 5

DEDUCE, without measurement, the 2 branch currents.

RECORD your deduction:

$$I_T = \left(\frac{1}{\frac{1}{10000} + \frac{1}{10000}} \right) \div 2$$

$$I_T = \frac{0.002}{2} A$$

I_1 and I_2 = 0.001A

I1= _____1mA_____

I2= _____1mA_____

MEASURE the supply and branch currents using a multimeter.

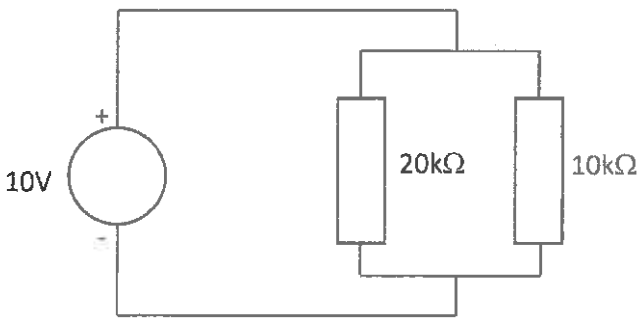
Measured Current = ___2mA_____

Measured Current in Branch 1 = __1mA_____

Measured Current in Branch 2 = ___1mA_____

Step 6

MAKE:



Step 7

CALCULATE the 2 branch currents using Ohm's Law.

RECORD your results:

Current in Branch 1 = ___0.5mA_____

Current in Branch 2 = __1mA_____ Calculation.

Supply Current = ____0.5mA____ + ____1mA____ = __1.5mA`_____ ✓

CONFIRM your results by measurement using a multimeter.

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CALCULATE the fraction of the supply current that is in the 20kΩ branch as follows:

Fraction in 20kΩ resistor = $\frac{\text{Current in 20k}\Omega}{\text{Supply Current}}$ = ___0.5mA_____ = 0.33mA

1.5mA

COMPARE the FRACTION obtained with the following result:

Fraction in 20kΩ resistor = $\frac{\text{Value of R in OTHER branch}}{\text{Sum of the 2 resistances}}$

$= \frac{10\text{k}\Omega}{10\text{k}\Omega + 20\text{k}\Omega} = \frac{1}{3}$

DEDUCE the current in Branch 2.

RECORD your deduction:

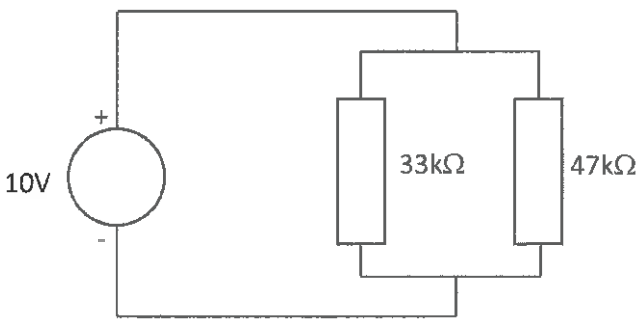
Current in Branch 2 = 2/3× Supply Current = ___0.00034A_____

and, from before:

Current in Branch 1 = 1/3× Supply Current = __0.00017A_____

Step 8

MAKE:



Step 9

MEASURE the Supply Current using a multimeter.

CALCULATE, using the concept of CURRENT DIVISION that was introduced at ***step 7***, the 2 branch currents.

RECORD your results:

Supply Current = ___5.2mA_____ ✓

Current in 47kΩ = ___2.1mA_____ $= \frac{33}{80} \times 0.0053 = 0.00218625A$ = 2.2mA X

Current in 33kΩ = ____0.3mA____ $\frac{47}{80} \times 0.0053 = 0.00311375A$

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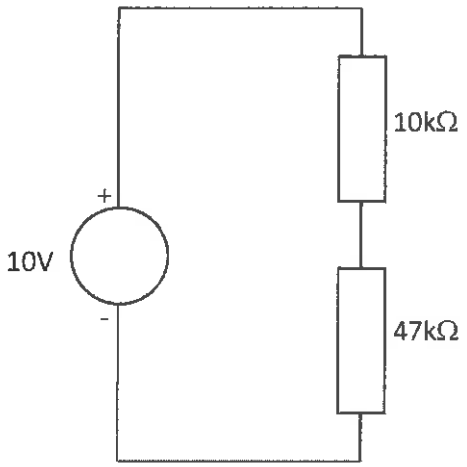
Lab 1c–The Product / Sum Rule

Objective

On completion of this work the student will be able to use the Product/Sum rule to find the equivalent resistance of two or more resistance in parallel.

Step 1

MAKE the following circuit:



Step 2

MEASURE using a multimeter the current in the circuit.

RECORD your observations:

Supply voltage = ____10.02V____

Current = ___0.000175A____ 10/57000 = 0.000175A

CALCULATE the circuit resistance.

RECORD your result:

Calculated resistance = __57KΩ_____

DISCONNECT the multimeter and power supply.

MEASURE the circuit resistance.

RECORD your result:

Measured resistance = ___56.7KΩ____

COMPARE the value calculated using Ohm's Law with the measured value.

RECORD your comparisons:

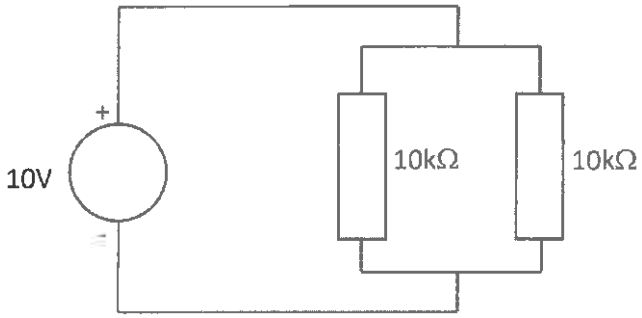
Calculated value of resistance = ____57KΩ____

Measured value of resistance = ___56KΩ____

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Step 3

MAKE:



Step 4

MEASURE using a multimeter the supply current.

RECORD your observation:

Supply Current = __2.045mA_____ ✓

Supply voltage = ___10.104V_____ ✓

CALCULATE the circuit resistance using Ohm's Law.

RECORD your result: $R = \frac{V}{I}$

Calculated resistance = ____5KΩ ___ $= R_T = \frac{1}{\frac{1}{10000}+\frac{1}{10000}} = 5000\Omega$

DISCONNECT the multimeter and the power supply.

MEASURE the circuit resistance.

RECORD your measurement:

Measured resistance = __4.93kΩ _____ ✓

FIND the PRODUCT of the 2 resistances and divide it by their SUM.

RECORD this operation:

Product = ____10000Ω ____ × ___10000Ω _____

Sum = __10000Ω _____ + __10000Ω _____

Result = ___5000Ω _____

COMPARE the value calculated, the measured value and the value found by the PRODUCT/SUM Rule.

RECORD your comparisons:

Ohm's Law value of resistance = __5000Ω _____

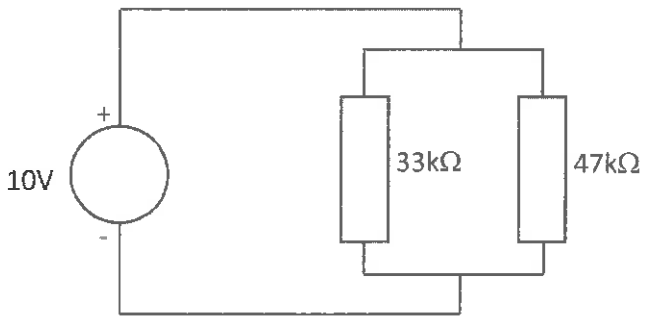
Measured value of resistance = ___4930Ω _____

Product/Sum value of resistance = __5000Ω _____

COMMENT on any discrepancy:

Step 5

MAKE:



Step 6

MEASURE the supply current using a multimeter.

RECORD your observation:

Supply Current = ___5.22mA_____

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Supply Voltage = __10.05V_____

CALCULATE the circuit resistance.

RECORD your result:

Calculated resistance = ___19387.5 Ω _____ $\frac{1}{\frac{1}{33000}+\frac{1}{47000}} = 19387.5\Omega$

DISCONNECT the multimeter and power supply.

MEASURE the circuit resistance.

RECORD your measurement:

Measured resistance = ___19.23k Ω _____

FIND the PRODUCT of the 2 resistances and divide it by their SUM.

RECORD this operation:

Product = ____33000 Ω ____ × ___47000 Ω _____

Sum = __33000 Ω _____ + ___47000 Ω _____

Result = ___19387.52 Ω _____

COMPARE the value calculated the measured value and the value found by the PRODUCT/SUM Rule.

RECORD your comparisons:

Ohm's Law value of resistance = __19387.5 Ω _____

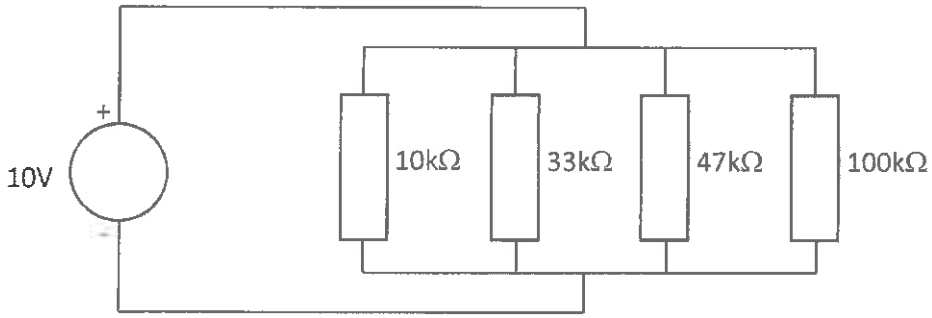
Measured value of resistance = __19.200 Ω _____

Product/Sum value of resistance = __19387.5 Ω _____

COMMENT on any discrepancy:

Step 7

MAKE:



Step 8

MEASURE the supply current using a multimeter.

RECORD your observation:

Supply Current = __1.650mA_____

Supply Voltage = _10.05V_____

CALCULATE the circuit resistance.

RECORD your result:

Calculated resistance = __6188.889 Ω _____

$$R_T = \frac{1}{\frac{1}{10000} + \frac{1}{33000} + \frac{1}{47000} + \frac{1}{100000}} = 6188.889\Omega$$

DISCONNECT the multimeter and power supply.

MEASURE the circuit resistance.

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RECORD your measurement:

Measured resistance = __6.12K Ω _____

FIND the PRODUCT of one pair of the 4 resistances and divide it by the SUM of the same pair.

RECORD this operation:

First pair: Product = ___10000 Ω _____ × _33000 Ω _____

Sum = ___10000 Ω _____ +___33000 Ω _____

Result = ___7.674417K Ω _____

FIND the PRODUCT of the other pair of the 4 resistances and divide it by the SUM of the same pair.

RECORD this operation:

Second pair: Product = __47000 Ω _____ × _100000 Ω _____

Sum = ___47000 Ω _____ + _100000 Ω _____

Result = __31972.790 Ω _____

REPEAT the PRODUCT/SUM rule on the results for the 2 pairs.

RECORD this operation:

Product of 2 results = __7674.417 Ω _____ × __31972.789 Ω _____

Sum of 2 results = __7674.417 Ω _____ + __31972.789 Ω _____

Final Result = _6188.898 Ω _____

COMPARE the value calculated using Ohm's Law with the measured value and the value found by the PRODUCT/SUM Rule.

RECORD your comparisons:

Ohm's Law value of resistance = __6188.889 Ω _____

Measured value of resistance = __6115 Ω _____

Product/Sum value of resistance = __6188.898 Ω _____

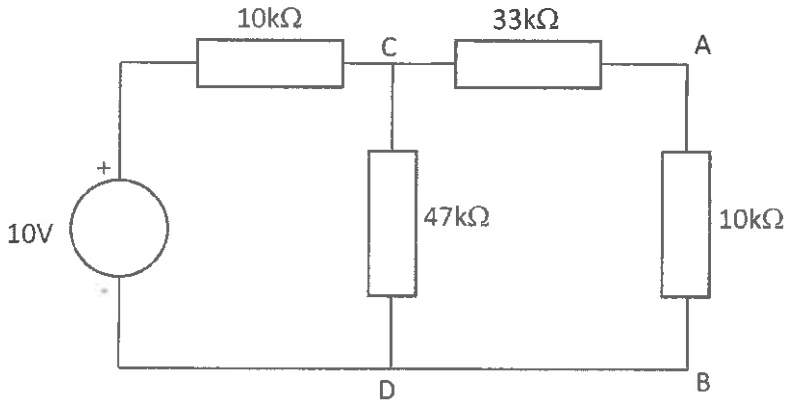
COMMENT on any discrepancy:

Lab 1d–Thevenin's Theorem

Objective

Step 1

MAKE:



/SDP

Step 2

STATE the steps that would be applied to the circuit when using Thevenin's theorem.

1. Open up the load resistor (10KΩ R_L)
2. Then calculate the open circuit voltage, this being the Thevenin voltage(V_{TH})
3. Short circuit the multiple power sources
4. Calculate the resistance that is found from the open circuit resistance

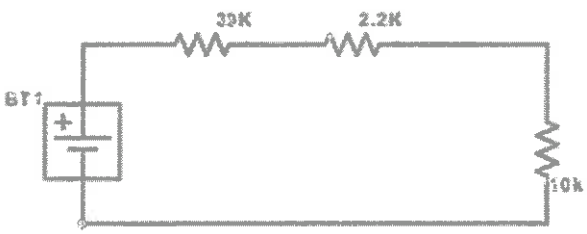
   RTH = 33kΩ + [(47kΩ x 10kΩ) / (47kΩ + 10kΩ)]

   RTH = 33kΩ + 8245.61kΩ

   RTH = 41245.61Ω
5. Once that has been done the circuit will then be redrawn using open circuit voltage found in step 2. Then measure open circuit resistance, found from step 4. Then reconnect the load resistor which was taken out in step 1. That will make it the equivalent Thevenins circuit of that network that has been created.
6. Find the total current flowing through using ohms law.

Step 3

DRAW the Thevenin equivalent circuit.



Step 4

MAKE the Thevenin equivalent circuit that you have drawn, in addition to the original circuit:

Step 5

FIT the resistor removed from AB across the terminals of your Thevenin Equivalent circuit.

MEASURE the actual current through the resistor using a multimeter.

Current = ___159.3 µA _____

MOVE the resistor from its position in the equivalent circuit to its position in the original circuit.

MEASURE the actual current through the resistor using a multimeter.

Current = __170.4 µA _____

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Summary-

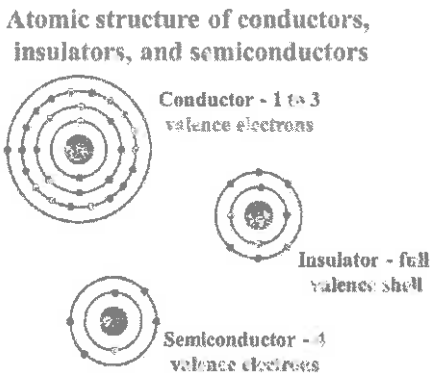
In this report all practical activities will be completed in class time with the equipment provided. Alongside this will be research conducted out of class periods, all research taken will be referenced and all images will be referenced.

Differences between conductivity and resistivity

Conductive materials

Conductors generally allow electricity to travel through it, conductivity can be measured in Siemens (S). A good conductive material can be identified also by its capability to retain heat. This proves its worth in an electrical circuit as this would reduce the amount of energy lost in a circuit saving money long term. Most metals are great conductors, copper wire are excellent conductors and are found in electrical circuitry today. In detail, a conductive material is conductive due to the number of free electrons that can be found on the outer shell and throughout a material. The free electrons can carry a current, the more space for these electrons to move about allows for them to pass around faster making a material more conductive than another. A valence electron is the strongest of all and proves to make a material more conductive, this is because of its capability to cause a strong repelling reaction when transferring to other electrons, materials that have this property are, gold, silver and copper, copper is used regularly for connective wiring in circuits due to the accessibility of current traveling through it. (Figure 1)

Image (Figure 1) -
http://slideplayer.com/slide/5768315/



Resistive materials

Resistivity is commonly assessed in electronics due to its importance and is measured in ohms (Ω). Resistivity is the electrical resistance of a certain conducting material per unit. Resistance is the amount a conductive material resists the flow of current/electricity, this in turn allows the energy to flow out of the electrical circuit, similar to how heat acts with resistive materials. If measuring in resistivity, those measurements are looking upon that materials ability to conduct electrical currents. Nickel-chromium is a wire that is resistive, it can be wounded with other nonconductive materials to make a Wire wound, useful for resisting electrical current.

Resistive materials affected by temperature

The resistance of a conductor is altered when heat is applied, a variable with this, is what size is the material being measured, a large wire will have less resistance than a smaller wire. Temperature effects the wire (in this case) due to the dimensions changing when the temperature does, this will make the wire expand or contrast. If a material is listed as a conductor, when it is heated the resistance of that material will rise. In contrast an insulator (resistive material) will decrease their resistance when heated. The change in conductivity is mainly due to the change in the activity of atom structure when the temperature rises. The flow of current in a resistive material is caused by electrons traveling form one atom to another, when temperature is added this changes the structure of those atoms, therefore changing the way in which current is passed through a resistive material.

In a resistive material when the heat is added there is a decrease in current flow, this is due to contrast and the fewer amount of electrons to pass the current through said material.

Voltage and current divider rule

Voltage divider rule (Figure 2) Current divider rule (Figure 3)

$$E_x = E_{total}\frac{R_x}{R_{total}} \qquad I_x = I_{total}\frac{R_{total}}{R_x}$$

https://www.allaboutcircuits.com/textbook/direct-current/chpt-6/current-divider-circuits/

Example parallel circuit – (resistor values, R1 = 1k R2 = 3k R3 = 2k) power supply = 6V

In a parallel circuit all voltages across all components (in this case, resistors) are the same. If the voltage supply was 6V all resistors would be 6 volts. Then using the voltage and the resistor values, the branch current can be worked out. R1 current = 6mA R2 current = 2mA R3 current = 3mA. The total current can be added together from all branches to work out the total current = 11mA. Once found total resistance can be found out by dividing voltage and current R=V/I total resistance would be 545.45Ω

R_1	R_2	R_3	Total
6	6	6	6
6m	2m	3m	11m
1k	3k	2k	545.45

Figure 4 is the speculated circuit displayed in table form as discussed above. The circuit shows that the current divider rule and voltage divider rule applies to basic resistor parallel circuits

(Figure 4)

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FdSc & HN COMMON ASSESSMENT AND MARKING CRITERIA

Assessment Criteria	OUTRIGHT FAIL REFER (equivalent to 0-29%	UNSATISFACTORY REFER (equivalent to 30-39%*	SATISFACTORY PASS (equivalent to 40-49%)	GOOD PASS (equivalent to 50-59%)	VERY GOOD MERIT (equivalent to 60-69%	EXCELLENT DISTINCTION (equivalent to 70-79%	EXCEPTIONAL DISTINCTION (equivalent to 80-100%
1. Research-informed Literature Extent of research and/or own reading, selection of credible sources, application of appropriate referencing conventions	Little or no evidence of reading. Views and findings unsupported and non-authoritative. Referencing conventions largely ignored.	Poor evidence of reading and/or of reliance on inappropriate sources, and/or indiscriminate use of sources. Referencing conventions used inconsistently.	References to a limited range of mostly relevant sources. Some omissions and minor errors. Referencing conventions evident though not always applied consistently.	Inclusion of a range of research-informed literature, including sources retrieved independently. Referencing conventions mostly consistently applied.	Inclusion of a wide range of research-informed literature, including sources retrieved independently. Selection of relevant and credible sources. Very good use of referencing conventions, consistently applied.	A comprehensive range of research informed literature embedded in the work. Excellent selection of relevant and credible sources. High-level referencing skills, consistently applied.	Outstanding knowledge of research-informed literature embedded in the work. Outstanding selection of relevant and credible sources. High-level referencing skills consistently and professionally applied.
2. Knowledge and Understanding of Subject Extent of knowledge and understanding of concepts and underlying principles associated with the discipline.	Major gaps in knowledge and understanding of material at this level. Substantial inaccuracies.	Gaps in knowledge, with only superficial understanding. Some significant inaccuracies.	Evidence of basic knowledge and understanding of the relevant concepts and underlying principles.	Knowledge is accurate with a good understanding of the field of study.	Knowledge is extensive. Exhibits understanding of the breadth and depth of established views.	Excellent knowledge and understanding of the main concepts and key theories. Clear awareness of challenges to established views and the limitations of the knowledge base.	Highly detailed knowledge and understanding of the main theories/concepts, and a critical awareness of the ambiguities and limitations of knowledge.
3. Analysis Analysis, evaluation and synthesis; logic, argument and judgement; analytical reflection; organisation of ideas and evidence	Unsubstantiated generalisations, made without use of any credible evidence. Lack of logic, leading to unsupportable/ missing conclusions. Lack of any attempt to analyse, synthesise or evaluate.	Some evidence of analytical intellectual skills, but for the most part descriptive. Ideas/findings sometimes illogical and contradictory. Generalised statements made with scant evidence. Conclusions lack relevance.	Evidence of some logical, analytical thinking and some attempts to synthesise, albeit with some weaknesses. Some evidence to support findings/ views, but evidence not consistently interpreted. Some relevant conclusions and recommendations, where relevant	Evidence of some logical, analytical thinking and synthesis. Can analyse new and/or abstract data and situations without guidance. An emerging awareness of different stances and ability to use evidence to support the argument. Valid conclusions and recommendations, where relevant	Sound, logical, analytical thinking; synthesis and evaluation. Ability to devise and sustain persuasive arguments, and to review the reliability, validity & significance of evidence. Ability to communicate ideas and evidence accurately and convincingly. Sound, convincing conclusions / recommendations.	Thoroughly logical work, supported by evaluated evidence. High quality analysis, developed independently or through effective collaboration. Ability to investigate contradictory information and identify reasons for contradictions. Strong, persuasive, conclusions, justifiable recommendations.	Exceptional work; judiciously selected and evaluated evidence. Very high quality analysis, developed independently or through effective collaboration. Ability to investigate contradictory information and identify reasons for contradictions. Highly persuasive conclusions
4. Practical Application and Deployment Effective deployment of appropriate methods, materials, tools and techniques; extent of skill demonstrated in the application of concepts to a variety of processes and/or contexts; formulation of innovative and creative solutions to solve problems.	Limited or no use of methods, materials, tools and/or techniques. Little or no appreciation of the context of the application.	Rudimentary application of methods, materials, tools and/or techniques but without consideration and competence. Flawed appreciation of the context of the application.	An adequate awareness and mostly appropriate application of well-established methods, materials, tools and/or techniques. Basic appreciation of the context of the application.	A good and appropriate application of standard methods, materials, tools and/or techniques. Good appreciation of the context of the application, with some use of examples, where relevant.	A very good application of a range of methods, materials, tools and/or techniques. Very good consideration of the context of the application, with perceptive use of examples, where relevant. Evidence of some innovation and creativity.	An advanced application of a range of methods, materials, tools and/or techniques. The context of the application is well considered, with extensive use of relevant examples. Application and deployment extend beyond established conventions. Innovation and creativity evident throughout.	Outstanding levels of application and deployment skills. Assimilation and development of cutting edge processes and techniques.
5. Skills for Professional Practice Demonstrates attributes expected in professional practice including: individual initiative and collaborative working; deployment of appropriate media to communicate (including written and oral); clarity and effectiveness in presentation and organisation.	Communication media is inappropriate or misapplied. Little or no evidence of autonomy in the completion of tasks. Work is poorly structured and/or largely incoherent.	Media is poorly designed and/or not suitable for the audience. Poor independent or collaborative initiative. Work lacks structure, organisation, and/or coherence	Can communicate in a suitable format but with some room for improvement. Can work as part of a team, but with limited involvement in group activities. Work lacks coherence in places and could be better structured.	Can communicate effectively in a suitable format, but may have minor errors. Can work effectively as part of a team, with clear contribution to group activities. Mostly coherent work and is in a suitable structure.	Can communicate well, confidently and consistently in a suitable format. Can work very well as part of a team, with very good contribution to group activities. Work is coherent and fluent and is well structured and organised.	Can communicate professionally and, confidently in a suitable format. Can work professionally within a team, showing leadership skills as appropriate, managing conflict and meeting obligations. Work is coherent, very fluent and is presented professionally.	Can communicate with an exceptionally high level of professionalism. Can work exceptionally well and professionally within a team, showing advanced leadership skills. Work is exceptionally coherent, very fluent and is presented professionally.

MARKING CRITERIA AND STUDENT FEEDBACK

This section details the assessment criteria. The *extent* to which these are demonstrated by you determines your mark. The marks available for each criterion are shown. Lecturers will use the space provided to comment on the achievement of the task(s), including those areas in which you have performed well and areas that would benefit from development/improvement.

Common Assessment Criteria Applied	Marks available	Marks awarded
1. Research-informed Literature Extent of research and/or own reading, selection of credible sources, application of appropriate referencing conventions	10	
limited range of relevant sources	4.5	
2. Knowledge and Understanding of Subject Extent of knowledge and understanding of concepts and underlying principles associated with the discipline	20	
Evidence of basic knowledge	8	
3. Analysis Analysis, evaluation and synthesis, logic, argument and judgement; analytical reflection; organisation of ideas and evidence	20	
Some logical thinking evident No Analysis given	8 0	
4. Practical Application and Deployment Deployment of methods, materials, tools and techniques; application of concepts; formulation of innovative and creative solutions to solve problems.	40	
Adequate awareness.	16	
5. Skills for Professional Practice Attributes in professional practice: individual and collaborative working; deployment of appropriate people, presentation and organisation	10	
Work lacks coherence in places Room for improvement	4	

Assignment Mark (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)	Late Submission Penalties (tick if appropriate)		
	Up to one week late (capped at 40%)		40 %
	First Attempt?	✓	

32.5

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Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Taflen Cyflwyno Aseiniad
Assignment Hand in Sheet

MANYLION Y MYFYRIWR STUDENT'S DETAILS			
ENW: NAME:		*RHIF P Y MYFYRIWR:* STUDENT P NUMBER:	P
CWRS: COURSE:	Foundation Year/HNC/HND/FdSc/BEng/BSc/MEng/MComp/MSc * *dileer fel y bo'n berthnasol* / delete as appropriate	*LEFEL Y CWRS:* LEVEL OF COURSE:	4
MODIWL: MODULE:	**ELECTRICAL TECHNOLOGY PSDE4021**		
TEITL YR ASEINIAD: ASSIGNMENT TITLE:	**DC Circuit Lab**		
DARLITHIWR/WYR: LECTURER/S:	Steve Roberts	*DYDDIAD:* DATE:	
Staff Llyfrgell YN UNIG / **Library Staff ONLY** *Derbynnwyd gan* / Accepted by: _____ *Dyddiad Cyflwyno:* Date Submitted: _____ *Amser* / Time: _____			

DERBYNNEB / RECEIPT			
ENW / NAME:		*RHIF P Y MYFYRIWR:* STUDENT P NUMBER:	P
CWRS / COURSE:	Foundation Year/HNC/HND/FdSc/BEng/BSc/MEng/MComp/MSc * *dileer fel y bo'n berthnasol* / delete as appropriate	*LEFEL Y CWRS* / LEVEL OF COURSE:	4
MODIWL / MODULE:	**Electrical Technology PSDE4021**		
TEITL YR ASEINIAD/ ASSIGNMENT TITLE:	**DC Circuit Lab**		
DARLITHIWR/WYR: LECTURER/S:	Steve Roberts	DYDDIAD / DATE:	
Staff Llyfrgell YN UNIG / **Library Staff ONLY** *Derbynnwyd gan* / Accepted by: _____ *Dyddiad Cyflwyno:* Date Submitted: _____ *Amser* / Time: _____			