

Basic Elec. Engr. Lab

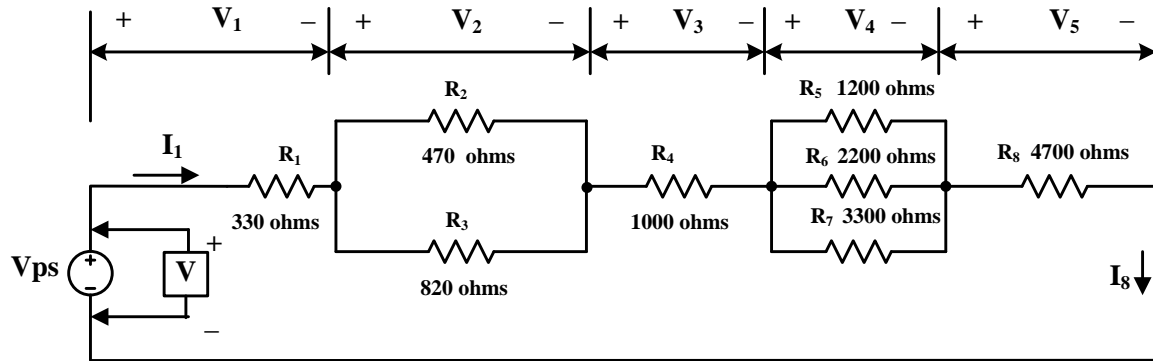
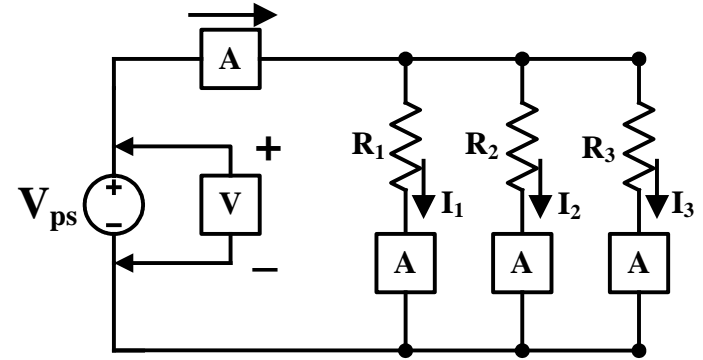
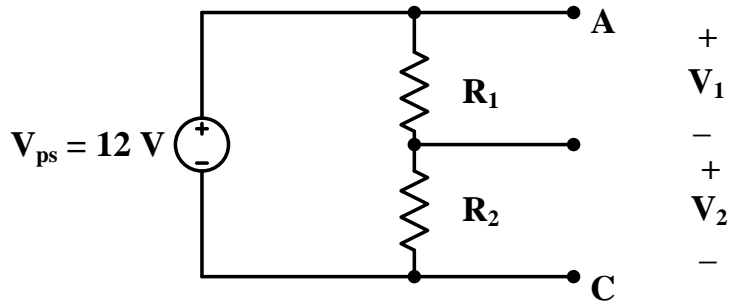
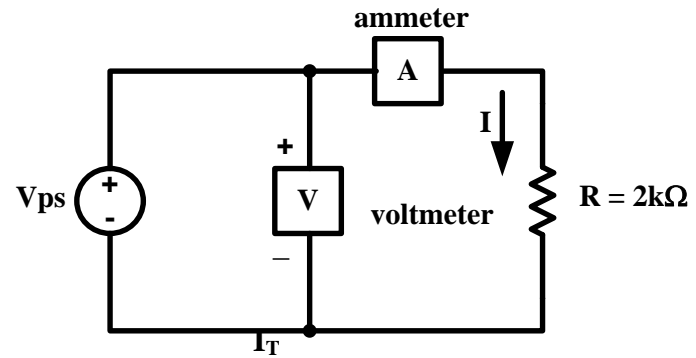
ECS 204

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Lab 1



Lab Report

- Submitted in group (**i.e., 1 copy per group**).
 - Submit at the beginning of the next lab
- It **must be neatly PRINTED** on clean A4 papers.
- Units are important.
- For student who **copies** *any part* of the report, a **zero** score will be given to *the whole* corresponding experiment.

Guideline/template

- Can download guideline/template from the class web site.
(<http://www2.siit.tu.ac.th/prapun/ecs204/>)

SCHOOL OF INFORMATION, COMPUTER AND COMMUNICATION TECHNOLOGY
 SIRINDHORN INTERNATIONAL INSTITUTE OF TECHNOLOGY
 THAMMASAT UNIVERSITY
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LAB REPORT
 <line>
 ECS 204 BASIC ELECTRICAL ENGINEERING LABORATORY
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EXPERIMENT 0 INTRODUCTION
 <line>
 By
 <line>
 Mr. A ID. 0000000000
 Ms. B ID. 0000000000
 <line>
 Group No. 12 Section 1
 <line>
 Date: 9 January 2012, Time: 9:00 – 12:30
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OBJECTIVES
 1. To introduce the course ECS 204 Basic Electrical Engineering Lab.
 2. To gain some understanding of basic equipment and components in the laboratory, and to be able to use them correctly in the experiments throughout the course.

<Remark. Use "12-point Times New Roman".>
 <A Microsoft Word version of this guideline can be downloaded from the class web site.>

DISCUSSION

<Summarize related theory and the way to compute the calculated values that are asked in the experiment.>
<Show the percentage error between calculations and measurements of all values.>

Calculations

In Part A.

The calculated values of V_i ($i = 1$ or 2) are obtained using the "voltage divider" formula

$$V_i = \frac{V_{ps} \times R_i}{R_1 + R_2}$$

For example,

- The value V_1 in the second row of Table X is calculated from

$$V_1 = \frac{12 \times 2000}{1000 + 2000} = 8 \text{ V.}$$

- The value V_2 in the second row of Table X is calculated from

$$V_2 = \frac{12 \times 1000}{1000 + 2000} = 4 \text{ V.}$$

In Part B.
.....

In Part C.
.....

Percentage Error

	Part A		Part B		Part C		
	R ₁	R ₂	R ₁	R ₂	R ₁	R ₂	R ₃
Resistance (Ω)	3%	4%	5%	6%	7%	8%	9%
Voltage (V)	0.1%	0.2%	0.3%	0.4%	0.5%	0.6%	0.7%
Current (A)	0.11%	0.22%	0.33%	0.44%	0.55%	0.66%	0.77%

Example of Percentage error Calculation

Note that the percentage error above is computed from the formula

$$\text{error} = \frac{(\text{measured} - \text{calculated})}{\text{measured}} \times 100 \%$$

Contents of the Report (1)

- Cover page and Objectives (3 pt)
- Procedure (10 pt)
 - Summarize what you need to do for each part of the lab
 - Do not copy the whole procedure part of the manual into this section.
 - Include photos of the circuits that you build.
 - A rule of thumb is to have photos that match all the figures given in the procedure parts of the manual.
- In-lab original results (with TA signatures) (10 pt)
 - If you work in pair, then this means two sets of results.
 - This will be the only section of the report that is handwritten.
- Results (printed) (10 pt)
 - Same as the previous part.
 - Typed / computer generated (plots, graphs, diagrams, schematics)

Contents of the Report (2)

- Discussion (10 pt)
 - Related theories
 - Show calculation
 - Errors, in percentage, reflecting the difference between the experimental results and the theoretical calculations for each part of the experiment.
- Conclusions (5 pt)
 - Summarize what you have done/accomplished.
 - Results agree with theoretical prediction?
 - Suggest source of error.
 - Demonstrate
 - your understanding of the experiments according to the objectives
 - the knowledge gained from the experiment.
 - Put some thought into this part!
- Answers to questions in the manual. (7 pt)

Lab 1

- Complete tables on page 11.
- Ask the TA to verify your results when you finish each part.
 - Do not wait until the end.

TABLE 1-1: Verification of Ohm's law

	R = _____			
V (volts)
I (amps)				
Calculated I (amps)				

TA Signature: _____

TABLE 1-2: Voltage-divider circuit

R₁ = _____ R₂ = _____

	V _{ps}	V ₁	V ₂
Measured value			
Calculated value	N/A		

TA Signature: _____

TABLE 1-3: Current-divider circuit

R₁ = _____ R₂ = _____ R₃ = _____

	V _{ps}	I ₁	I ₂	I ₃	I _T
Measured value					
Calculated value	N/A				

TA Signature: _____

TABLE 1-4: Verification of Kirchhoff's laws

V_{ps} = _____ (measured). V_{ps} = _____ (calculated in part D.4).

R ₁ = R ₂ = R ₃ = R ₄ = R ₅ = R ₆ = R ₇ = R ₈ =	Measured value					Calculated value				
	V ₁	V ₂	V ₃	V ₄	V ₅	V ₁	V ₂	V ₃	V ₄	V ₅
	Measured value					Calculated value				
	I ₁	I ₂	I ₃	I ₄	I ₅	I ₆	I ₇	I ₈	I ₂ + I ₃	I ₅ + I ₆ + I ₇

TA Signature: _____

Tips

- Never put the DMM in ammeter (current measuring) mode directly across the two terminals of the power supply.
 - This will blow the fuse inside the DMM.
 - You can use “continuity testing” to check for a blown fuse.
- Record “3.98” when the DMM displays “3.98”.
- Record “4.00” (not simply 4) when the DMM displays “4.00”.
- When you work on each of the experiments, carefully follow the steps provided.