Basic Elec. Engr. Lab

ECS 204/210

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Office Hours:
BKD 3601-7
Tuesday 15:00-16:00
Friday 14:00-16:00

Announcement

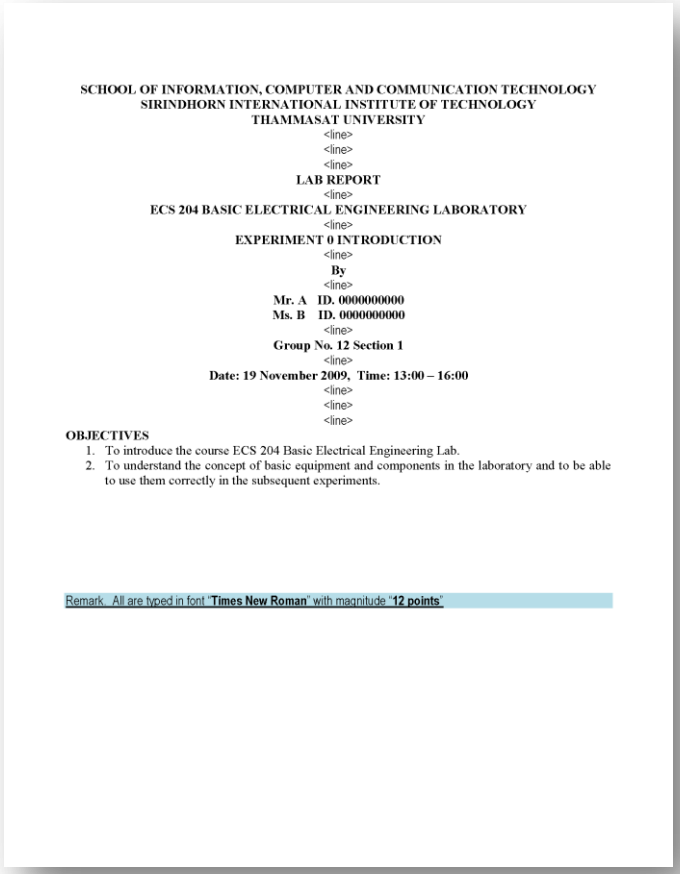
- Lab manuals for Lab 2 along with the guideline for lab report are available at the **copy center**.
  - There are *many* basic EE labs! Make sure that you buy the right one.

Lab Report

- Submitted in group (**i.e., 1 copy per group**).
  - Submit at the beginning of the next lab
  - No report = no quiz.
    - Caution: If you are the one who keep the lab report with you, your lab partner cannot take the quiz until you arrive and submit the report.
- It **must be neatly PRINTED on a clean A4 paper.**
- 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. (prapun.com/ecs210)



SCHOOL OF INFORMATION, COMPUTER AND COMMUNICATION TECHNOLOGY
SIRINDHORN INTERNATIONAL INSTITUTE OF TECHNOLOGY
THAMMASAT UNIVERSITY
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LAB REPORT
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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: 19 November 2009, Time: 13:00 – 16:00
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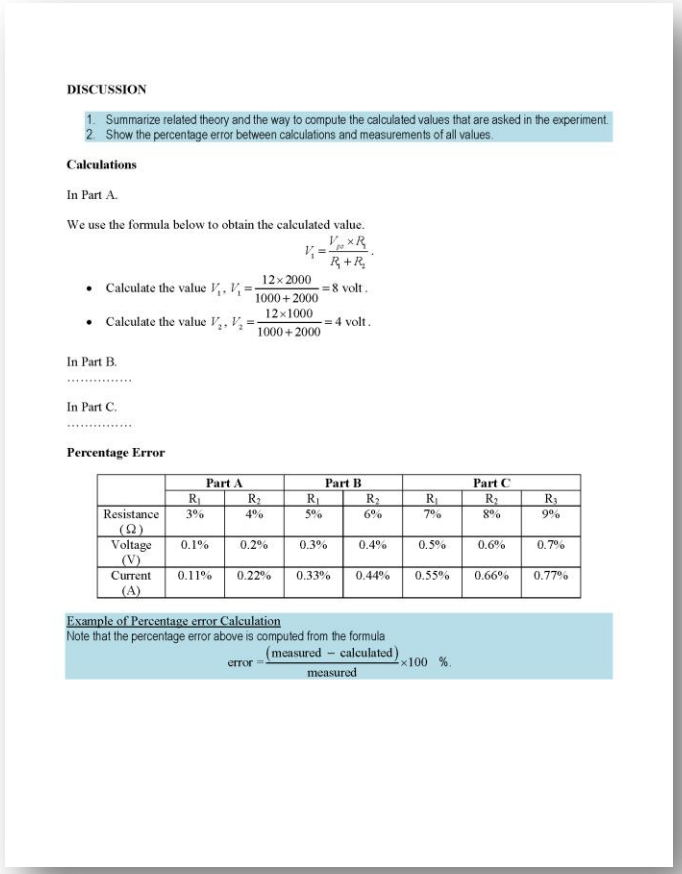
OBJECTIVES

1. To introduce the course ECS 204 Basic Electrical Engineering Lab.
2. To understand the concept of basic equipment and components in the laboratory and to be able to use them correctly in the subsequent experiments.

Remark All are typed in font "**Times New Roman**" with magnitude "**12 points**"



DISCUSSION

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

Calculations

In Part A.

We use the formula below to obtain the calculated value.

$$V_1 = \frac{V_{ps} \times R_1}{R_1 + R_2}.$$

- Calculate the value V_1, $V_1 = \frac{12 \times 2000}{1000 + 2000} = 8$ volt.
- Calculate the value V_2, $V_2 = \frac{12 \times 1000}{1000 + 2000} = 4$ volt.

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

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

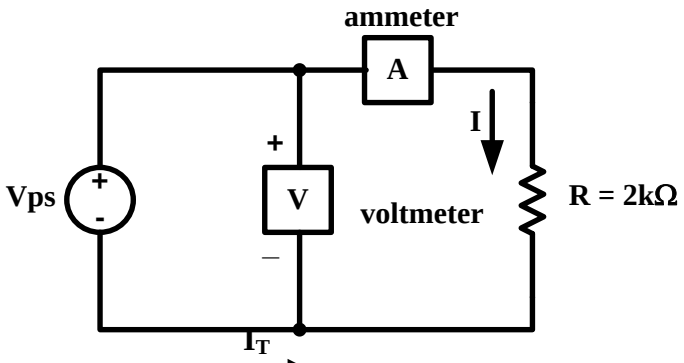
Contents of the Report (1)

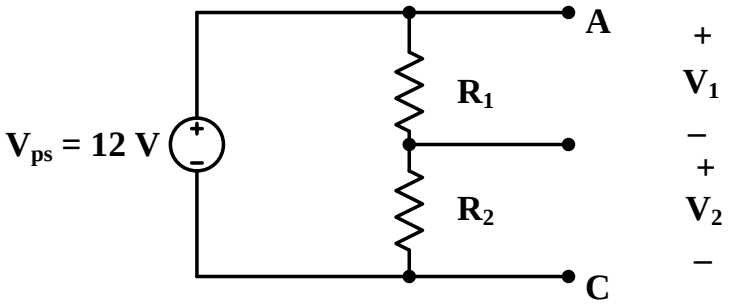
- Cover page and objectives
- In-lab original results (with TA signatures)
  - If you work in pair, then this means two sets of results.
  - This will be the only section of the report that is handwritten.
- Results (printed).
  - Same as the previous part.
  - Typed / computer generated (plots, graphs, diagrams, schematics)
- Discussion
  - Related theories
  - Show calculation
  - Errors, in percentage, reflecting the difference between the experimental results and the theoretical calculations for each part of the experiment.

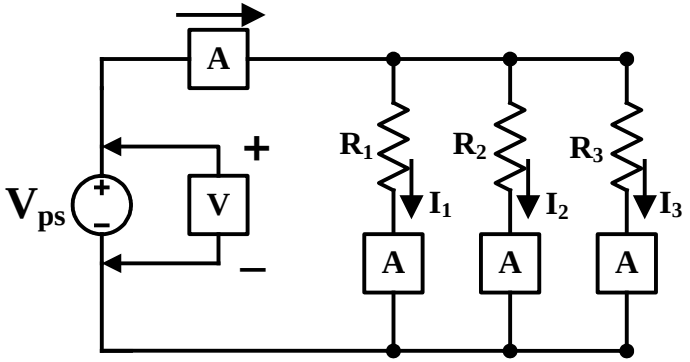
Contents of the Report (2)

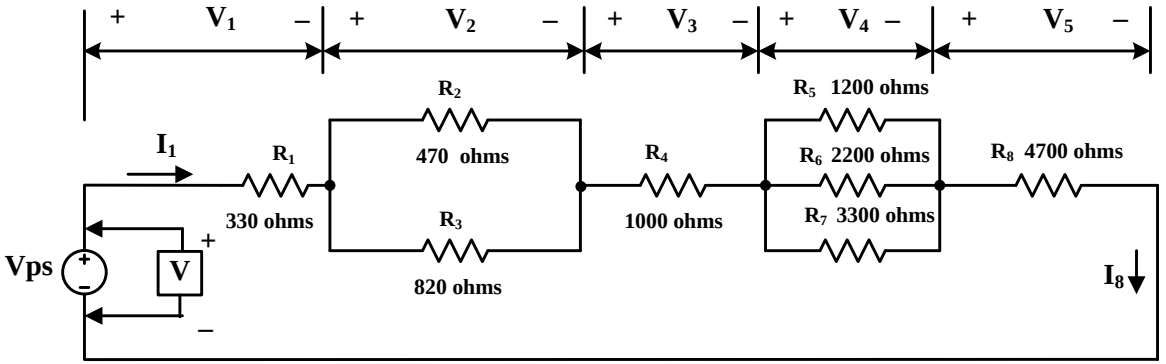
- Conclusions
  - Summarize what you have done/accomplished.
  - Results agree with your prediction?
  - Suggest source of error.
  - Demonstrate
    - your understanding of the experiments according to the objectives
    - the knowledge gained from the experiment.
  - Put some thought into this part!
- Answers to questions in the manual.

Lab 1


ammeter
A
I
Vps
+
V
voltmeter
R = 2kΩ
–


A
R1
Vps = 12 V
R2
C
+
V1
–
+
V2
–


IT
A
+
R1
R2
R3
Vps
V
–
I1
I2
I3
A
A
A


+ V1 –
+ V2 –
+ V3 –
+ V4 –
+ V5 –
R2
R5 1200 ohms
I1
R1
470 ohms
R4
R6 2200 ohms
R8 4700 ohms
330 ohms
R3
1000 ohms
R7 3300 ohms
Vps
+
V
–
820 ohms
I8

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)	10	15	20	25
I (amps)				
Calculated I (amps)				

TA Signature:

TABLE 1-2: Voltage-divider circuit

R_1 = _____ R_2 = _____

	V_{ps}	V_1	V_2
Measured value			
Calculated value	N/A		

TA Signature:

TABLE 1-3: Current-divider circuit

R_1 = _____ R_2 = _____ R_3 = _____

	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 =

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:

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