

FACULTY OF ELECTRICAL ENGINEERING	
Subject ELECTRICAL ENGINEERING LABORATORY	Review : 6
Subject Code SKEE 2742	Release Date : February 2020
	Last Amendment : March 2023
	Procedure Number : PK-UTM-FKE-(O)-08



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UNIVERSITI TEKNOLOGI MALAYSIA

**FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MALAYSIA**

SKEE 2742

ELECTROTECHNIC LABORATORY

EXPERIMENT 1

SUPERPOSITION, THEVENIN AND NORTON THEOREMS

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I. PRELIMINARY EXERCISE (10 marks)

Important Note: Student required to do this exercise BEFORE the lab session

- Describe briefly the Superposition, Thevenin and Norton theorems by using an example from your own circuit.
- For the circuit in **Figure 1**, by using Superposition theorem, calculate current, I_L voltage, V_L and power, P_L at $R_L = 20 \Omega$, 50Ω and 100Ω .
- Repeat step (ii) by using Thevenin and Norton theorems.
- Perform the circuit analysis using any simulation tools (PSPICE, MATLAB, Multisim, etc.) to validate your results.
- Discuss briefly the importance of Superposition, Thevenin and Norton theorems in circuit analysis

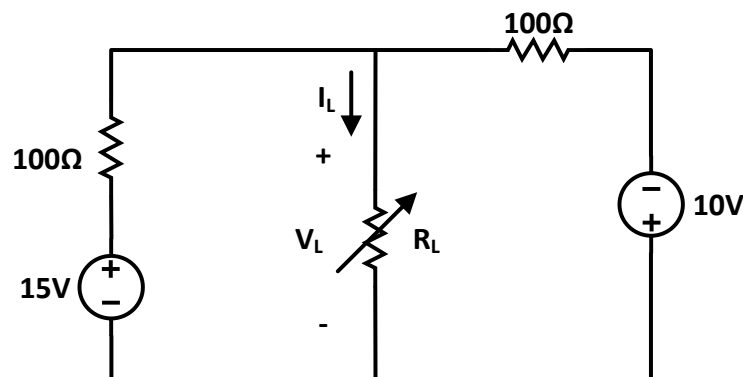


Figure 1

Important Note: Student required to bring their laptop to VERIFY all simulations result

Recommended Reference

Alexander & Sadiku, 'Fundamental of Electric Circuit 6th edition', McGraw Hill.

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II. EXPERIMENT

‘Superposition, Thevenin and Norton Theorems’

IMPORTANT: Student need to complete the PRELIMINARY EXERCISE before the laboratory session.

1. Aims:

To solve circuit analysis problem by using Superposition, Thevenin and Norton theorems.

2. Instructions:

- i. Based on the circuit in Figure 1, setup an experiment to measure the current, I_L and voltage, V_L of the load for $R_L = 20 \Omega, 40 \Omega, 50 \Omega, 70 \Omega, 80 \Omega$ and 100Ω ;
 - a. based on the original circuit.
 - b. by using Superposition theorem
 - c. by using Thevenin theorem
 - d. by using Norton theorem
- ii. Calculate the power absorbed by R_L from the measurement in step 3(i).
- iii. Compare and comment on results of the three theorems against the original circuit in terms of voltage, current and power.
- iv. Discuss the advantages and disadvantages of each theorem.