

V_{oc}	
R_{Th}	
I_{sc} / G_{Th}	

EXPERIMENT No. 1

Objective:

To verify Thevenin's theorem in DC Network.

Apparatus:

- DC Power Supply (0-30V)
- Multimeter
- Resistor

Circuit Diagram:



Theory:

Thevenin's Theorem is used to simplify the analysis of complex networks into a standard equivalent network. Suppose that a complex network consists of number of sources and resistors connected in any manner, then according to this theorem,

"Any network can be replaced by a single source V_{th} in series with a single resistance R_{th} ."

V_{th} or V_{oc} is the open-circuit voltage across the terminals A and B i.e., find the voltage that the network produces across the two terminals with an open-circuit between A and B. This voltage is called the Thevenin Equivalent Voltage. R_{th} is the open-circuit resistance across the terminals A and B but with all the sources killed in the network. This resistance is called the Thevenin Equivalent Resistance. For R_{th} , voltage sources are replaced by short circuits and current sources are replaced by open circuits.

The output of the Thevenin and actual circuits is the same. This condition is called the **Equivalent Equivalence** from the viewpoint of the Two Output Terminals. Although Thevenin Equivalent circuit is not the same as its original network, it acts as same in terms of the output voltage and current.

Lab Manual Circuit Analysis

Robert Boylestad, Brian Olivari



Lab Manual Circuit Analysis:

Lab Manual for Introductory Circuit Analysis Robert L. Boylestad, Gabriel Kousourou, 2015-07-09 The primary objectives of this revision of the laboratory manual include insuring that the procedures are clear that the results clearly support the theory and that the laboratory experience results in a level of confidence in the use of the testing equipment commonly found in the industrial environment For those curriculums devoted to a dc analysis one semester and an ac analysis the following semester there are more experiments for each subject than can be covered in a single semester The result is the opportunity to pick and choose those experiments that are more closely related to the curriculum of the college or university All of the experiments have been run and tested during the 13 editions of the text with changes made as needed The result is a set of laboratory experiments that should have each step clearly defined and results that closely match the theoretical solutions Two experiments were added to the ac section to provide the opportunity to make measurements that were not included in the original set Developed by Professor David Krispinsky of Rochester Institute of Technology they match the same format of the current laboratory experiments and cover the material clearly and concisely All the experiments are designed to be completed in a two or three hour laboratory session In most cases the write up is work to be completed between laboratory sessions Most institutions begin the laboratory session with a brief introduction to the theory to be substantiated and the use of any new equipment to be used in the session *Circuit Analysis* Allan H. Robbins, Wilhelm C. Miller, 1995-01-01 Technologists can use this book as a reference for electric circuit theory laws of electrical circuits and the 1200 full color diagrams and photographs of components instruments and circuits Laboratory Manual to Accompany Introductory Circuit Analysis Robert L. Boylestad, Gabriel Kousourou, 2006-08 *Laboratory Manual for Introductory Circuit Analysis* Robert L. Boylestad, Gabriel Kousourou, 2010 **Circuit Analysis Laboratory Workbook** Teri L. Piatt, Kyle E. Laferty, 2022-06-01 This workbook integrates theory with the concept of engineering design and teaches troubleshooting and analytical problem solving skills It is intended to either accompany or follow a first circuits course and it assumes no previous experience with breadboarding or other lab equipment This workbook uses only those components that are traditionally covered in a first circuits course e g voltage sources resistors potentiometers capacitors and op amps and gives students clear design goals requirements and constraints Because we are using only components students have already learned how to analyze they are able to tackle the design exercises first working through the theory and math then drawing and simulating their designs and finally building and testing their designs on a breadboard *Lab Manual for Introductory Circuit Analysis* Robert Boylestad, Brian Olivari, 2022-07-24 For courses in DC AC circuits conventional flow The latest insights in circuit analysis with detailed calculation guidance Introductory Circuit Analysis has been the number one acclaimed text in the field for over 50 years Boylestad presents complex subject matter clearly and with an eye on practical applications He provides detailed guidance in using the TI 89 Titanium calculator the choice for this text to perform all the

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DC Electrical Circuits James Fiore, 2016-08-30 Featuring a total of 15 experiments this laboratory manual fully addresses the field of DC electrical circuit analysis It begins with an introduction to a standard electrical laboratory and progresses through basic measurements of voltage and current to series parallel and series parallel resistive circuit configurations More advanced topics include the superposition technique for multi source circuits nodal analysis mesh analysis Th venin s Theorem maximum power transfer and an introduction to capacitors and inductors Each experiment includes a theory overview electrical component parts list and test equipment inventory Most exercises may be completed with just a digital multimeter and a dual output DC power supply This is the print version of the on line OER Lab Manual for Boctor's Electric Circuit Analysis Mohamed Ghorab, Shiva Prabhu, 1992 **Circuit Analysis 1** , 2011 Instructor's Solutions Manual to the Lab Manual for Electric Circuit Analysis {by} S.A. Boctor Mohamed Ghorab, 1987 Circuit Analysis Allan Robbins, 2000 The mathematical foundation and the practical application of circuit theory in this highly readable book will prove invaluable to students enrolled in electronics engineering technology curriculum and professionals alike This one of a kind text provides comprehensive coverage of circuit analysis topics including fundamentals of DC and AC circuits methods of analysis capacitance inductance magnetism simple transients and computer methods Hundreds of step by step examples lead the user through the critical thinking processes required to solve problems Two popular computer simulation packages OrCAD PSpice Version 9 and Electronics Workbench are integrated throughout the book to support what if situations With the Online Companion users can access a web site that contains RealAudio sound clips that present more in depth discussions of the most difficult topics covered in each chapter **Electrical Circuit Analysis Lab** Mr. Rohit Manglik, 2024-07-28 EduGorilla Publication is a trusted name in the education sector committed to empowering learners with high quality study materials and resources Specializing in competitive exams and academic support EduGorilla provides comprehensive and well structured content tailored to meet the needs of students across various streams and levels **AC Electrical Circuits** James Fiore, 2014-01-13 This laboratory manual features a total of 15 experiments in the field of AC electrical circuit analysis It begins with basic RL and RC operation and progresses through phasors to AC series parallel and series parallel circuit configurations It also includes experiments focusing on the superposition technique Th venin s Theorem maximum power transfer and series and parallel resonance An introductory oscilloscope exercise is included using either a two or four channel digital oscilloscope Each experiment includes a theory overview electrical component parts list and test equipment inventory Most exercises may be completed with just a digital multimeter two channel oscilloscope and an AC function generator This is the print version of the on line Open Educational Resource **ELEX 1105 Lab Manual** , 2011 Advanced Circuit Analysis I (Laboratory Manual). , 2005 LABORATORY MANUAL - DC ELECTRICAL CIRCUIT ANALYSIS Fiore. James M., *Electric Circuits Laboratory Manual* Farzin Asadi, 2023-03-27 This book provides insights into practical aspects of electric circuits The author provides real world examples throughout this book The devices chosen for

this book can be found in nearly all laboratories No expensive measurement devices are used throughout the book Someone who reads this book has a better understanding of practical aspects of electric circuits Chapter 1 introduces tools that will be used in the next chapters Chapter 2 studies the resistors and contains 9 experiments Chapter 3 studies the digital multimeters and contains 7 experiments Chapter 4 studies Kirchhoff s voltage current law nodal mesh analysis and Thevenin equivalent circuits This chapter contains 5 experiments Chapter 5 studies the first and second order circuits RC RL and RLC and contains 4 experiments Chapter 6 studies the DC and AC steady state behavior of electric circuits and frequency response of filters and has 5 experiments Chapter 7 studies magnetic coupling and transformers and contains 3 experiments Appendix A shows how different types of graphs can be drawn with MATLAB Appendix B reviews the concept of root mean square

Simulation-based Labs for Circuit Analysis Massimo Mitolo,2024-08-16 Simulation based Labs for Circuit Analysis brings you an unparalleled learning experience integrating cutting edge simulation tools Multisim Live and Tinkercad to explore the realm of circuits Circuit analysis is the cornerstone of electrical and electronic engineering and with the advent of advanced simulation software learning has taken a transformative turn Delve into a virtual laboratory environment that replicates real world circuit experiments with precision and flexibility allowing you to grasp complex concepts effortlessly Recreate experiments multiple times gaining deeper insights into circuit characteristics and behavior across various scenarios Aspiring engineers and technicians circuit enthusiasts and educators will find Simulation based Labs for Circuit Analysis an indispensable resource for unlocking the boundless possibilities of circuit analysis in the digital age Whether you are a student seeking to excel in your studies or a professional looking to refine your engineering skills this book will empower you to innovate explore and experiment without limits

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