

Exercise 1-1

Chapter 1

Solutions to Exercises within the Chapter

Ex: 1.1 When output terminals are open-circuited, as in Fig. 1.1a:

For circuit a,  $v_{oc} = v_1(t)$   
 For circuit b,  $v_{oc} = 1.00 \times R_2$

When output terminals are short-circuited, as in Fig. 1.1b:

For circuit a,  $i_{sc} = \frac{v_1(t)}{R_1}$   
 For circuit b,  $i_{sc} = I_1(t)$   
 For equivalency  
 $R_1 I_1(t) = v_2(t)$



Figure 1.1a

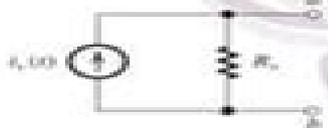


Figure 1.1b

Ex: 1.2



$v_{oc} = 10 \text{ mV}$   
 $i_{oc} = 10 \text{ }\mu\text{A}$   
 $R_1 = \frac{v_{oc}}{i_{oc}} = \frac{10 \text{ mV}}{10 \text{ }\mu\text{A}} = 1 \text{ k}\Omega$

Ex: 1.3 Using voltage divider:

$v_2(t) = v_1(t) \times \frac{R_2}{R_1 + R_2}$



Given  $v_1(t) = 10 \text{ mV}$  and  $R_1 = 1 \text{ k}\Omega$ .

If  $R_2 = 100 \text{ k}\Omega$   
 $v_2 = 10 \text{ mV} \times \frac{100}{100 + 1} = 9.9 \text{ mV}$

If  $R_2 = 10 \text{ k}\Omega$   
 $v_2 = 10 \text{ mV} \times \frac{10}{10 + 1} = 9.1 \text{ mV}$

If  $R_2 = 1 \text{ k}\Omega$   
 $v_2 = 10 \text{ mV} \times \frac{1}{1 + 1} = 5 \text{ mV}$

If  $R_2 = 100 \text{ }\Omega$   
 $v_2 = 10 \text{ mV} \times \frac{100}{100 + 1 \text{ K}} = 0.91 \text{ mV}$

For  $v_2 = 0.5v_1$ ,

$\frac{R_2}{R_1 + R_2} = 0.5$

Since  $R_1 = 1 \text{ k}\Omega$ ,

$R_2 = 1 \text{ k}\Omega$

Ex: 1.4 Using current divider:



$I_2 = I_1 \times \frac{R_1}{R_1 + R_2}$

Given  $I_1 = 10 \text{ }\mu\text{A}$ ,  $R_1 = 100 \text{ k}\Omega$ .

For  $R_2 = 1 \text{ k}\Omega$ ,  $I_2 = 10 \text{ }\mu\text{A} \times \frac{100}{100 + 1} = 9.9 \text{ }\mu\text{A}$

For  $R_2 = 10 \text{ k}\Omega$ ,  $I_2 = 10 \text{ }\mu\text{A} \times \frac{100}{100 + 10} = 9.1 \text{ }\mu\text{A}$

For  $R_2 = 100 \text{ k}\Omega$ ,  $I_2 = 10 \text{ }\mu\text{A} \times \frac{100}{100 + 100} = 5 \text{ }\mu\text{A}$

For  $R_2 = 1 \text{ M}\Omega$ ,  $I_2 = 10 \text{ }\mu\text{A} \times \frac{100 \text{ K}}{100 \text{ K} + 1 \text{ M}}$   
 $= 0.9 \text{ }\mu\text{A}$

For  $I_2 = 0.5I_1$ ,  $\frac{100}{100 + R_2} = 0.5$

$\Rightarrow R_2 = 25 \text{ k}\Omega$

# Electric Circuits 8th Edition

**Richard C. Dorf**



## **Electric Circuits 8th Edition :**

*Introduction to Electric Circuits 8th Edition International Student Version with WileyPLUS Set* Richard C.

Dorf,2010-08-28     **Electric Circuits Fundamentals** Thomas L. Floyd,2007 The seventh edition of Thomas Floyd s introductory textbook to electric circuits covers both AC and DC circuit fundamentals and describes a range of electronic devices and components at a level pitched at technicians and students It includes brief biographies of key individuals to provide a historical context     *Electric Circuits* James William Nilsson,Susan A. Riedel,2008 Designed for use in a one or two semester Introductory Circuit Analysis or Circuit Theory Courses taught in Electrical or Computer Engineering Departments The most widely used introductory circuits textbook Emphasis is on student and instructor assessment and the teaching philosophies remain To build an understanding of concepts and ideas explicitly in terms of previous learning To emphasize the relationship between conceptual understanding and problem solving approaches To provide students with a strong foundation of engineering practices     **Introduction to Engineering Analysis** Kirk D. Hagen,2009 The goal of this text is to introduce a general problem solving approach for the beginning engineering student Thus Introduction to Analysis focuses on how to solve any kind of engineering analytical problem in a logical and systematic way The book helps to prepare the students for such analytically oriented courses as statics strength of materials electrical circuits fluid mechanics thermodynamics etc     *The Industrial Electronics Handbook - Five Volume Set* Bogdan M. Wilamowski,J. David Irwin,2011-03-04 Industrial electronics systems govern so many different functions that vary in complexity from the operation of relatively simple applications such as electric motors to that of more complicated machines and systems including robots and entire fabrication processes The Industrial Electronics Handbook Second Edition combines traditional and new     [Electricity and Magnetism Fundamentals](#) Lakshman Kalyan,2025-02-20 Electricity and Magnetism Fundamentals offers a comprehensive journey into the realm of electromagnetism exploring both theoretical principles and practical applications This guide is tailored for students researchers and enthusiasts seeking a deeper understanding of electromagnetism We cover fundamental principles including Maxwell s equations electromagnetic waves and electromagnetic induction The book delves into practical applications in everyday life such as wireless communication technologies medical imaging devices power generation and transportation systems Real world examples and case studies illustrate how electromagnetism shapes modern technology and society The book integrates theoretical concepts with experimental techniques encouraging readers to apply theoretical knowledge in practical settings Hands on experiments and demonstrations foster deeper insights into electromagnetism phenomena With contributions from experts across disciplines we offer insights into electromagnetism s role in physics engineering biology and beyond Rich illustrations diagrams and photographs enhance the learning experience making complex concepts more accessible Electricity and Magnetism Fundamentals is an essential resource for anyone seeking to understand electromagnetism s impact on diverse scientific and

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The Journal of the Institution of Electrical Engineers Institution of Electrical Engineers, 1924

**Journal of the Institution of Electrical Engineers** ,1929

*Introduction to Electric Circuits* Richard C. Dorf, James A. Svoboda, 2010-01-07 The central theme of Introduction to Electric Circuits is the concept that electric circuits are a part of the basic fabric of modern technology Given this theme this book endeavors to show how the analysis and design of electric circuits are inseparably intertwined with the ability of the engineer to design complex electronic communication computer and control systems as well as consumer products This book is designed for a one to three term course in electric circuits or linear circuit analysis and is structured for maximum flexibility

**Journal** ,1929 Includes annual report of its council 1941 48 in pt 1

*The Cumulative Book Index* ,1930

**The Electrical Review** ,1922

**Telegraph Age** ,1906

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