



METADATA

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Abstract

The aim of this book is to provide future engineers with basic knowledge that will enable them to communicate electrical circuit issues and their practical applications with clarity, precision, and correctness, with other colleagues, demonstrating sufficient professionalism. For this reason, the selected circuit theory exercises contained and analyzed in it, relate to simple typical applied problems of alternating single-phase and three-phase circuits, domestic and industrial applications (such as modeling transformers, various types of electrical consumers, bridge circuits, frequency filters, voltage and current dividers). Likewise, DC circuit applications concern applications such as photovoltaic systems, battery charging, and supercapacitors. The relevant knowledge background provided is about the basic knowledge of physics, answering questions in the fields of energy, power,

electric charge, the structure of the atom, magnetic and electric fields, and electromagnetic waves, as well as the necessary mathematical background concerning operations with complex numbers and representation of time equations in the frequency domain (rotating vectors). Each theoretical analysis is supplemented by solved examples of escalating complexity. The book is completed with a series of laboratory exercises, simulating important electrical circuits (implemented in the free PSpice software) which help in the theoretical understanding of the solution of the exercises, without, of course, replacing the corresponding experiments that would be accomplished on the laboratory bench. Circuit simulations, among other things, allow us to easily and quickly observe the changes presented in the output of a circuit, depending on the changes in the input parameters and its elements.

