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Electrical Circuits and Systems

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Foreword

Technological progress has nowhere been more rapid than in the fields of electronics, electrical, and control engineering. The *Macmillan Basis Books in Electronics Series* of books have been written by authors who are specialists in these fields, and whose work enables them to bring technological developments sharply into focus.

Each book in the series deals with a single subject so that undergraduates, technicians, and mechanics alike will find information within the scope of their courses. The books have been carefully written and edited to allow each to be used for self-study; this feature makes them particularly attractive not only to readers approaching the subject for the first time, but also to mature readers wishing to update and revise their knowledge.

Noel M. Morris

Preface

This book deals with the principles of electrical circuits and systems, and to enable the reader to improve his understanding of the subject, a large number of worked examples are included in the text. Consequently, those attending a wide range of courses at universities, polytechnics, and colleges of further education will benefit from the book. It will also be of service to mature engineers wishing to refresh their knowledge. The book also provides other readers who are not directly concerned with electrical engineering with the principles of the subject.

The book begins with a chapter on the basis of electrical circuits, dealing with the fundamental concepts and units involved. There follow three chapters on important aspects of circuits, namely circuit theorems, electromagnetism, and electrostatics. After this, attention is directed to the solution of alternating current circuits – in four chapters the topics of alternating voltage and current, single-phase circuits, complex notation, and polyphase circuits are discussed. The transformer is the subject of a chapter in which it is considered variously as a power-transforming device, as an impedance level converting device, and as an element in a coupled circuit. The book concludes with a chapter on transient effects in electrical circuits.

I would like to acknowledge the encouragement I have received from my wife during the preparation of this book, and the forbearance of my family.

Meir Heath

Noel M. Morris