

# Electrical Circuits in Biomedical Engineering: Problems with Solutions

This book provides a comprehensive collection of problems and solutions in electrical circuits as they apply to biomedical engineering. The problems cover a wide range of topics, including basic circuit analysis, network analysis, and bioelectric circuits. The solutions are worked out in detail and provide a step-by-step guide to solving the problems.



## Electrical Circuits in Biomedical Engineering: Problems with Solutions by Natalie N. Hooks

★★★★★ 5 out of 5

Language : English  
File size : 61712 KB  
Text-to-Speech : Enabled  
Screen Reader : Supported  
Enhanced typesetting : Enabled  
Print length : 1283 pages



This book is a valuable resource for students, researchers, and practicing engineers in the field of biomedical engineering.

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- Chapter 1: Basic Circuit Analysis
- Chapter 2: Network Analysis
- Chapter 3: Bioelectric Circuits

## **Chapter 1: Basic Circuit Analysis**

This chapter covers the basic principles of circuit analysis, including Ohm's law, Kirchhoff's laws, and Thevenin's theorem. The problems in this chapter are designed to help students master these basic concepts.

- Problem 1: Find the current through a 10-ohm resistor connected to a 12-volt battery.
- Problem 2: Find the voltage across a 10- $\mu$ F capacitor connected to a 10-volt battery.
- Problem 3: Find the impedance of a circuit consisting of a 10-ohm resistor and a 10- $\mu$ F capacitor connected in series.

## **Chapter 2: Network Analysis**

This chapter covers the analysis of more complex circuits, including AC circuits, transformers, and filters. The problems in this chapter are designed to help students develop the skills needed to analyze these circuits.

- Problem 1: Find the current through a 10-ohm resistor connected to a 12-volt AC source.
- Problem 2: Find the voltage across a 10- $\mu$ F capacitor connected to a 10-volt AC source.
- Problem 3: Design a low-pass filter with a cutoff frequency of 1 kHz.

## **Chapter 3: Bioelectric Circuits**

This chapter covers the application of electrical circuits to biomedical engineering. The problems in this chapter are designed to help students

understand how electrical circuits are used to measure and analyze biological signals.

- Problem 1: Design a circuit to measure the electrocardiogram (ECG).
- Problem 2: Design a circuit to measure the electromyogram (EMG).
- Problem 3: Design a circuit to measure the electroencephalogram (EEG).

This book provides a comprehensive collection of problems and solutions in electrical circuits as they apply to biomedical engineering. The problems are designed to help students master the basic concepts of circuit analysis and develop the skills needed to analyze more complex circuits. This book is a valuable resource for students, researchers, and practicing engineers in the field of biomedical engineering.



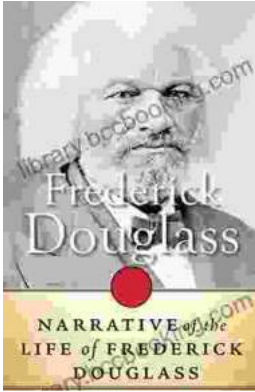
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