#### Chapter 7, Problem 1.

In the circuit shown in Fig. 7.81

$$v(t) = 56e^{-200t}V, t > 0$$

$$r(r) = 8e^{-300r} \text{mA}, r > 0$$

- (a) Find the values of R and C.
- (b) Calculate the time constant r.
- (c) Determine the time required for the voltage to decay half its initial value at t = 0.

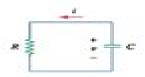


Figure 7.81 For Prob. 7.1

#### Chapter 7, Solution 1.

For the resistor, V=iR=  $56e^{-200t} = 8Re^{-200t} \times 10^{-3}$   $\longrightarrow$   $R = \frac{56}{8} = \frac{7 \text{ k}\Omega}{}$ 

$$C = \frac{1}{200R} = \frac{1}{200X7X10^2} = \frac{0.7143\mu F}{200X7X10^2}$$

- (b) τ =1/200= 5 ms
- (c) If value of the voltage at = 0 is 56.

$$\frac{1}{2}x56 = 56e^{-200t} \qquad \longrightarrow \qquad e^{200t} = 2$$

$$200t_o = \ln 2$$
  $\longrightarrow$   $t_o = \frac{1}{200} \ln 2 = 3.466 \text{ ms}$ 

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# **Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition**

Dr. Matthew N. O. Sadiku

#### **Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition:**

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#### **Table of Contents Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition**

- 1. Understanding the eBook Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition
  - The Rise of Digital Reading Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition
  - Advantages of eBooks Over Traditional Books
- 2. Identifying Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
- 3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition
  - User-Friendly Interface
- 4. Exploring eBook Recommendations from Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition
  - Personalized Recommendations
  - Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition User Reviews and Ratings
  - Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition and Bestseller Lists
- 5. Accessing Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition Free and Paid eBooks
  - Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition Public Domain eBooks
  - Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition eBook Subscription Services
  - Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition Budget-Friendly Options

- 6. Navigating Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition eBook Formats
  - o ePub, PDF, MOBI, and More
  - Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition Compatibility with Devices
  - Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition Enhanced eBook Features
- 7. Enhancing Your Reading Experience
  - Adjustable Fonts and Text Sizes of Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition
  - Highlighting and Note-Taking Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition
  - Interactive Elements Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition
- 8. Staying Engaged with Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition
- 9. Balancing eBooks and Physical Books Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition
  - Benefits of a Digital Library
  - o Creating a Diverse Reading Collection Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition
- 10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
- 11. Cultivating a Reading Routine Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition
  - Setting Reading Goals Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition
  - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition
  - Fact-Checking eBook Content of Solution Manuals For Fundamentals Of Electric Circuits 3rd Edition
  - Distinguishing Credible Sources
- 13. Promoting Lifelong Learning
  - Utilizing eBooks for Skill Development
  - Exploring Educational eBooks
- 14. Embracing eBook Trends
  - Integration of Multimedia Elements

• Interactive and Gamified eBooks

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