

This Book



Electronic Devices
and Integrated
Circuits

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4.9. SOLVED PROBLEMS

1. Determine the peak and rms voltages on the secondary of a transformer connected across a bridge rectifier to provide a no load dc voltage of 9 V. If the secondary winding resistance is 3 Ω and dynamic resistance of each diode is 1 Ω , determine the dc output across a load resistance of 100 Ω and 1 K. Also determine the regulation.

Solution:

$$r_s = 3 \Omega, r_d = 1 \Omega, R_L = 100 \Omega, V_{dc} = \frac{2V_m}{\pi}$$

$$V_m = \frac{9\pi}{2} = 14.14 \text{ V}$$

$$V_{rms} = \frac{V_m}{\sqrt{2}} = \frac{14.14}{1.414} = 10 \text{ V}$$

$$I_m = \frac{V_m}{r_s + 2r_d + R_L} = \frac{14.14}{100} = 0.135 \text{ A}$$

$$I_{dc} = \frac{2I_m}{\pi} = \frac{2 \times 0.135}{\pi} = 86.45 \text{ mA}$$

$$V_{dc} = I_{dc}R_L = 86.56 \times 10^{-3} \times 100 = 8.66 \text{ V}$$

$$V_{dc}(\text{full load}) = \frac{2V_m}{\pi} \left(1 - \frac{r_s + 2r_d}{r_s + 2r_d + R_L} \right)$$

$$= 8.57 \text{ V} = 8.6 \text{ V}$$

$$\text{Regulation} = \frac{9 - 8.6}{8.6} = 4.6\%$$

2. A 220 V, 60 Hz voltage is applied to a centre tapped step-down transformer of 22: 1 with a load of 1 K connected across the output of two-diode full-wave rectifier. Assume diodes to be ideal. If the resistance of half-secondary winding is 0.5 Ω , determine the (a) peak, rms and dc voltages, (b) peak, rms and dc currents, (c) dc power delivered to the load, (d) VA rating of the transformer secondary, (e) ac input to transformer assuming it to be 80% efficient, (f) ac ripple voltage across the load and its frequency, (g) How much is the PIV of each diode if the circuit is changed to a bridge rectifier using the full secondary winding of the same transformer? (h) How much are the peak, rms, dc voltages?

Solution:

$$(a) V_m (\text{between full secondary}) = 10\sqrt{2} = 14.14 \text{ V}$$

$$V_{rms} (\text{full secondary}) = 10 \text{ V}, V_m (\text{half secondary}) = 7.07 \text{ V}$$

Two Thousand Solved Problems In Electronics

S. P. Bali



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Schaum's Outline of Theory and Problems of Electronic Devices and Circuits Jimmie J. Cathey,1989 This updated version of its internationally popular predecessor provides and introductory problem solved text for understanding fundamental concepts of electronic devices their design and their circuitry Providing an interface with Pspice the most widely used program in electronics new key features include a new chapter presenting the basics of switched mode power supplies thirty one new examples and twenty three PS solved problems *Essentials of Electronic Circuitry* Alphonse J. Sistino,1996-03-05 This text presents the design and analysis of electronic circuitry providing fundamental information in mathematical quantities including voltage current and impedance relationships in the passive and electronic components It shows how to solve equations using an HP48S or equivalent calculator offering a computer code that illustrates frequency dependent transistor circuits and a code that explains heat transfer The book proposes and analyzes over 100 basic circuits using the nodal method **The Electronics Journal** ,1910 **The Trade Reform Act of 1973** United States. Congress. Senate.

Committee on Finance,1974 The Trade Reform Act of 1973, Hearings Before..., 93-2... United States. Congress. Senate.

Committee on Finance,1974 ELECTRONIC INSTRUMENTS AND INSTRUMENTATION TECHNOLOGY ANAND, M. M. S.,2004-01-01 The standard laboratory tools in the modern scientific world include a wide variety of electronic instruments used in measurement and control systems This book provides a firm foundation in principles operation design and applications of electronic instruments Commencing with electromechanical instruments the specialized instruments such as signal analyzers counters signal generators and digital storage oscilloscope are treated in detail Good design practices such as grounding and shielding are emphasized The standards in quality management basics of testing compatibility calibration traceability metrology and various ISO 9000 quality assurance guidelines are explained as well The evolution of communication technology in instrumentation is an important subject A single chapter is devoted to the study of communication methods used in instrumentation technology There are some areas where instrumentation needs special type of specifications one such area is hazardous area The technology and standards used in hazardous areas are also discussed An instrumentation engineer is expected to draw and understand the instrumentation drawings An Appendix explains the symbols and standards used in P I diagrams with several examples Besides worked out examples included throughout end of chapter questions and multiple choice questions are also given to judge the student s understanding of the subject Practical and state of the art in approach this textbook will be useful for students of electrical electronics and instrumentation engineering

Probability, Random Variables, and Random Signal Principles Peyton Z. Peebles,1993 Today any well designed electrical engineering curriculum must train engineers to account for noise and random signals in systems The best approach is to emphasize fundamental principles since systems can vary greatly Professor Peebles s book specifically has this emphasis offering clear and concise coverage of the theories of probability random variables and random signals including the response of linear networks to random waveforms By careful organization the book allows learning to flow naturally from the most elementary to the most advanced subjects Time domain descriptions of the concepts are first introduced followed by a thorough description of random signals using frequency domain Practical applications are not forgotten and the book includes discussions of practical noises noise figures and noise temperatures and an entire special chapter on applications of the theory Another chapter is devoted to optimum networks when noise is present matched filters and Wiener filters This third edition differs from earlier editions mainly in making the book more useful for classroom use Beside the addition of new topics Poisson random processes measurement of power spectra and computer generation of random variables the main change involves adding many new end of chapter exercises 180 were added for a total of over 800 exercises The new exercises are all clearly identified for instructors who have used the previous edition

Schaums Outline of Engineering Economics Jose A. Sepulveda,William E. Souder,Byron S. Gottfried,1984-06-22 Algebraic relationships and solution procedures Discrete periodic compounding Continuous compounding

Schaum's Outline of Beginning Physics I:

Mechanics and Heat Alvin Halpern, 1995-01-22 Introductory text **American Book Publishing Record**, 1992
Schaum's Outline of Feedback and Control Systems, Second Edition Joseph J. DiStefano, Allen Stubberud, Ivan J. Williams, 1990 If you want top grades and thorough understanding of feedback and control systems both analog and digital in less study time this powerful study tool is the best tutor you can have It takes you step by step through the subject and gives you accompanying problems with fully worked solutions plus hundreds of additional problems with answers at the end of chapters so you can measure your progress You also get the benefit of clear detailed illustrations Famous for their clarity wealth of illustrations and examples and lack of tedious detail Schaum s Outlines have sold more than 30 million copies worldwide This guide will show you why Introduction to Operational Amplifier Theory and Applications John V. Wait, Lawrence P. Huelsman, Granino Arthur Korn, 1992 This senior graduate level text with its concise and direct treatment of the subject emphasizes the design of circuits and systems which use operational amplifiers The effect of amplifier specifications on circuit performance are treated in detail Separate chapters cover major applications topics including the design of active RC filters electronic switchers and analog digital digital analog interfacing subscriptions **2000 Solved Problems in Electronics** Jimmie J. Cathey, 1990 Computational Aids in Control Systems Using MATLAB Hadi Saadat, 1993 Accompanying computer disk contains functions and examples developed by the author

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