

JOHN P. BORRIS

SOFTWARE ENCLOSED
Book not returnable if software
has been removed.
© PRENTICE-HALL, INC.

Semiconductor Devices Using Electronics Workbench[®]

Suranaree University of Technology



31051000606455

Second Edition

TABLE OF CONTENTS

Helpful Hints on Electronics Workbench®	i
Introduction to Electronics Workbench®	ii
 Chapter 1, Review of AC Circuits	 1
Introduction	1
Procedure	3
 Chapter 2, Diode Characteristics	 7
Introduction	7
Procedure	8
Key Concepts	12
Hardware Lab, Diode Characteristics	15
Chapter 2 Questions	17
 Chapter 3, Zener Curve & Characteristics	 18
Introduction	18
Procedure	18
Key Concepts	22
Hardware Lab, Zener Curve & Characteristics	23
Chapter 3 Questions	25
 Chapter 4, Half-Wave Rectifier Circuits, Part 1	 26
Introduction	26
Procedure	27
Key Concepts	29
Hardware Lab, Half-Wave Rectifier Circuits, Part 1	31
Chapter 4 Questions	33
 Chapter 5, Half-Wave Rectifier Circuits, Part 2	 34
Introduction	34
Procedure	34
Key Concepts	36
Hardware Lab, Half-Wave Rectifier Circuits, Part 2	40
Chapter 5 Questions	42

Chapter 6, Full-Wave Bridge Rectifiers	43
Introduction	43
Procedure	43
Key Concepts	46
Hardware Lab, Full-Wave Bridge Rectifiers	49
Chapter 6 Questions	51
 Chapter 7, Center-Tapped Transformer Rectifiers	 52
Introduction	52
Procedure	52
Key Concepts	55
Hardware Lab, Center-Tapped Transformer Rectifiers	58
Chapter 7 Questions	60
 Chapter 8, Full-Wave Zener Rectifier	 61
Introduction	61
Procedure	61
Key Concepts	63
Hardware Lab, Full-Wave Zener Rectifier	65
Chapter 8 Questions	67
 Chapter 9, Transistor Biasing, Part 1, Fixed & Emitter Bias Circuits	 68
Introduction	68
Procedure	69
Key Concepts	70
Hardware Lab, Transistor Biasing, Part 1, Fixed & Emitter Bias Circuits	73
Chapter 9 Questions	75
 Chapter 10, Transistor Biasing, Part 2, Emitter & Feedback Biasing	 76
Introduction	76
Procedure	76
Key Concepts	79
Hardware Lab, Transistor Biasing, Part 2, Emitter & Feedback Biasing	81
Chapter 10 Questions	84
 Chapter 11, Transistor Biasing, Part 3	 85
Introduction	85
Procedure	85
Key Concepts	87
Hardware Lab, Transistor Biasing, Part 3	89
Chapter 11 Questions	91

Chapter 12, Common Emitter Amplifier, Part 1	92
Introduction	92
Procedure	92
Key Concepts	96
Hardware Lab, Common Emitter Amplifier, Part 1	100
Chapter 12 Questions	102
Chapter 13, Common Emitter Amplifier, Part 2	103
Introduction	103
Procedure	103
Key Concepts	107
Hardware Lab, Common Emitter Amplifier, Part 2	111
Chapter 13 Questions	114
Chapter 14, Common Emitter Amplifier, Part 3	115
Introduction	115
Procedure	115
Key Concepts	118
Hardware Lab, Common Emitter Amplifier, Part 3	120
Chapter 14 Questions	123
Chapter 15, Common Base Amplifier	124
Introduction	124
Procedure	124
Key Concepts	127
Hardware Lab, Common Base Amplifier	131
Chapter 15 Questions	133
Chapter 16, Common Collector Amplifier, Part 1	134
Introduction	134
Procedure	134
Key Concepts	138
Hardware Lab, Common Collector Amplifier, Part 1	142
Chapter 16 Questions	145
Chapter 17, Common Collector Amplifier, Part 2	146
Introduction	146
Procedure	146
Key Concepts	149
Hardware Lab, Common Collector Amplifier, Part 2	152
Chapter 17 Questions	154

Chapter 18, Common Collector Amplifier, Part 3	155
Introduction	155
Procedure	155
Key Concepts	157
Hardware Lab, Common Collector Amplifier, Part 3	160
Chapter 18 Questions	162
 Chapter 19, JFET Circuit Design	 163
Introduction	163
Procedure	163
Key Concepts	165
Hardware Lab, JFET Circuit Design	169
Chapter 19 Questions	171
 Chapter 20, Multistage Power Amplifier	 172
Introduction	172
Procedure	172
Hardware Lab, Multistage Power Amplifier	175
Chapter 20 Questions	178
 Chapter 21, Troubleshooting: Full-Wave Bridges	 179
Introduction	179
Procedure	179
 Chapter 22, Troubleshooting: Zener Regulated Power Supply	 181
Introduction	181
Procedure	181
 Chapter 23, Troubleshooting: CE Amplifiers, Part 1	 183
Introduction	183
Procedure	183
 Chapter 24, Troubleshooting: CE Amplifiers, Part 2	 186
Introduction	186
Procedure	186
 Chapter 25, Troubleshooting: Common Collector Amplifiers	 189
Introduction	189
Procedure	189

Chapter 26, Troubleshooting: Multistage Amplifiers	192
Introduction	192
Procedure	192
 Chapter 27, Troubleshooting: JFET Amplifiers	195
Introduction	195
Procedure	195
 Appendix, Circuit Equivalents with DC & AC Formulas	198
Half-Wave Rectifier	198
Full-Wave Bridge Rectifier, No Filtering	198
Center-Tapped Transformer, Full-Wave Bridge with Filter Capacitor	199
Common Emitter Fixed Bias Circuit	200
Fixed Bias AC Model	200
Common Emitter Feedback Biasing	201
Collector Emitter Feedback AC Model	201
Common Emitter Voltage Divider Biasing, No Emitter, Bypass Capacitor	202
Common Emitter Voltage Divider, AC Model, Emitter Not Bypassed	202
Common Emitter Voltage Divider, Emitter Bypassed	203
Common Emitter Voltage Divider, AC Model, Emitter Bypassed	203
Common Emitter Voltage Divider, Emitter Partially Bypassed	204
Common Emitter Voltage Divider, AC Model, Emitter Partially Bypassed	204
Common Base Amplifier	205
Common Base Amplifier, AC Model	205
Common Collector Amplifier	206
Common Collector AC Model	206
FET Common Source Amplifier	207
FET Common Source AC Model	207