



CONTENTS

	Preface	xi
PART ONE	DC ELECTRICITY	1
CHAPTER 1	A Circuit Diagram Sampler	3
	Block Diagrams	3
	Schematic Diagrams	9
	More Diagrams	13
	Quiz	16
CHAPTER 2	Charge, Current, Voltage, and Resistance	21
	Charge	21
	Current	27
	Voltage	29
	Resistance	32
	Quiz	35
CHAPTER 3	Ohm's Law, Power, and Energy	38
	Prefix Multipliers	38
	Ohm's Law	40
	Power	43
	Energy	46
	Quiz	49

CHAPTER 4	Simple DC Circuits	52
	Series Circuits	52
	Parallel Circuits	58
	Kirchhoff's Laws	64
	Quiz	67
CHAPTER 5	Cells and Batteries	71
	Electrochemical Power	71
	Common Cells and Batteries	78
	Photovoltaics	81
	Fuel Cells	85
	Quiz	86
	Test: Part One	89
PART TWO	AC ELECTRICITY	101
CHAPTER 6	Fundamentals of AC	103
	How a Wave Alternates	103
	The Shape of the Wave	107
	The Strength of the Wave	111
	How AC Is Produced	116
	Quiz	119
CHAPTER 7	Electricity in the Home	122
	Phase	122
	Transformers	128
	Ohm's Law, Power, and Energy	133
	Lightning	139
	Quiz	141
CHAPTER 8	Power Supplies	145
	Rectifiers	145
	Filtering and Regulation	151

	Protection of Equipment	156
	Quiz	161
CHAPTER 9	Wire and Cable	164
	Wire Conductors	164
	Wire Splicing	173
	Electrical Cable	175
	Connectors	180
	Quiz	186
	Test: Part Two	189
PART THREE	MAGNETISM	201
CHAPTER 10	What Is Magnetism?	203
	Magnetic Force	203
	Magnetic Field Strength	209
	Geomagnetism	213
	Quiz	217
CHAPTER 11	Electromagnetic Effects	221
	Electromagnetic Deflection	221
	Electromagnetic Fields	226
	Electromagnetic Interference	233
	EM versus ELF	235
	Quiz	238
CHAPTER 12	Practical Magnetism	241
	Electromagnets	241
	Magnetic Materials	244
	Magnetic Devices	250
	Magnetic Media	260
	Magnetic Levitation	264
	Quiz	276



CONTENTS

	Test: Part Three	278
	Final Exam	289
APPENDIX 1	Answers to Quiz, Test, and Exam Questions	309
APPENDIX 2	Symbols Used in Schematic Diagrams	313
	Suggested Additional References	330
	Index	331