TABLE OF CONTENTS

Chapter No.	Title	Page No.
1	Power Semiconductor Devices	01-62
	1.1 Introduction to Power Electronics	
	1.2 Overview of Power Semiconductor Devices	
	1.3 Thyristors (SCR, TRIAC, DIAC)	
	1.4 Power BJT, MOSFET, IGBT	
	1.5 Gate and Base Drive Circuits	
	1.6 Protection and Isolation Techniques	
	1.7 Thermal Modeling and Heat Sink Design	
2	Controlled Rectifiers	63-88
	2.1 Principles of Controlled Rectification	
	2.2 Single-phase Controlled Rectifiers with R, RL, RLE	
	Loads	
	2.3 Three-phase Controlled Rectifiers	
	2.4 Effect of Source Inductance and Commutation Overlap	
	2.5 Dual Converters	
	2.6 Freewheeling Diodes	
	2.7 Performance Analysis: THD, Power Factor, Ripple	
3	DC-DC Converters (Choppers)	89-108
	3.1 Introduction and Classification of Choppers	
	3.2 Step-down (Buck) Converter	
	3.3 Step-up (Boost) Converter	
	3.4 Buck-Boost and Inverting Converters	
	3.5 Cuk and SEPIC Converters	
	3.6 Switched Mode Power Supplies (SMPS)	
4	Inverters and AC Voltage Controllers	109-137
	4.1 Introduction to Inverters (VSI and CSI)	
	4.2 Single-phase Inverters: Half and Full Bridge	
	4.3 Three-phase Inverters: 120° and 180° Modes	
	4.4 PWM Techniques	
	4.5 Harmonics and LC Filter Design	
	4.6 Multilevel Inverters	
	4.7 AC Voltage Controllers	

5	Electric Drives and Control	138-156
	5.1 Basics and Classification of Electrical Drives	
	5.2 Dynamics of Electrical Drives	
	5.3 DC Motor Drives	
	5.4 Induction Motor Drives	
	5.5 Synchronous Motor Drives	
	5.6 Drive Selection, Protection, and Performance Design	
6	Special Topics and Emerging Trends	157-181
	6.1 Resonant Converters: ZVS and ZCS Techniques	
	6.2 Matrix Converters: Principle and Advantages	
	6.3 Electric Drives in Renewable Energy Systems	
	6.4 Drives for Electric and Hybrid Electric Vehicles	
	(EV & HEV)	
	6.5 AI and ML-based Intelligent Control in Drives	
	6.6 Power Electronics in Smart Grid and FACTS	