

CONTENTS

PREFACE

1.	GENERAL QUANTUM MECHANICS		3
	1.1	Born Approximation for Short-Range Interaction	3
	1.2	Shadow Scattering	6
	1.3	Waves and Particles	10
	1.4	Angle Operator	14
	1.5	The Adiabatic Expansion	17
	1.6	Interpretation of Quantum Mechanics	23
	1.7	γ-Ray Microscope	34
	1.8	Alarm-Clock Paradox	36
2.	QU	ANTUM THEORY OF ATOMS	40
	2.1	Scattering of γ-Rays	40
	2.2	Limits of the Heitler-London Approximation	44
	2.3	Ground State of 2n Fermions in One Dimension	48
3.	STATISTICAL MECHANICS		51
	3.1	Pauli Principle in Metals	51
	3.2	Ionization	53
	3.3	Perturbation Theory for Statistical Equilibrium	56
	3.4	Minimum Property of the Free Energy	58
	3.5	Variation Principle for First N States	61
	3.6	Influence of Boundary Conditions	64
	3.7	Specification of Surface Energy	68
	3.8	Irreversibility	73
4.	CONDENSED MATTER		
	4.1	Melting in One, Two, and Three Dimensions	85
	4.2	Momentum of Phonons	91
	4.3	Electron Diamagnetism	99
	4.4	De Haas-Van Alphen Effect	105
5.	TRA	ANSPORT PROBLEMS	111
	5.1	Density Expansion of Diffusion Coefficient	111
	5.2		115
	5.3	Perturbation Theory in Transport Problems	121

vi CONTENTS

6.	MANY-BODY PROBLEMS	127
	6.1 Off-Shell Effects in Multiple Scattering	127
	6.2 Perturbation Theory in Many-Body Syst	ems 132
	6.3 Positronium Formation in Metals	137
7.	NUCLEAR PHYSICS	147
	7.1 The Shell Model	147
	7.2 Center-of-Mass Motion	155
8.	RELATIVITY	160
	8.1 Radiation in Hyperbolic Motion	160