Table of Contents

	Page
PREFACE	χi
INTRODUCTION	1
CHAPTER 1. BASIC PROBLEMS	5
§1. Statement of the Electrostatic Problems for Perfect Conductors	5
§2. Statement of the Basic Problem for Dielectric Bodies §3. Reduction of the Basic Problems to Fredholm's Integral	8
Equations of the Second Kind	9
§4. Reduction of the Static Problems to Fredholm's Integral Equations of the First Kind	13
CHAPTER 2. ITERATIVE PROCESSES FOR SOLVING FREDHOLM'S INTEGRAL EQUATIONS FOR THE STATIC PROBLEMS	15
51. An Iterative Process for Solving the Problem of Equilib- rium Charge Distribution and Charge Distribution on a Conductor Placed in an Exterior Static Field	15
§2. An Iterative Process for Solving the Problem of Dielectri Bodies in an Exterior Static Field	c 17
§3. A Stable Iterative Process for Finding the Equilibrium Charge Distribution	22
§4. An Iterative Process for Calculating the Equilibrium Charge Distribution on the Surface of a Screen	23
CHAPTER 3. CALCULATING ELECTRIC CAPACITANCE	25
51. Capacitance of Solid Conductors and Screens	25
§2. Variational Principles and Two-Sided Estimates of Capacitance	27
§3. Capacitance of Conductors in an Anisotropic and Nonhomo-	31
geneous Medium §4. Physical Analogues of Capacitance	35
§5. Calculating the Potential Coefficients	36
CHAPTER 4. NUMERICAL EXAMPLES	41
1. Introduction	41 41
 Capacitance of a Circular Cylinder Capacitance of a Parallelepiped of Arbitrary Shape 	41
 Capacitance of a Parallelepiped of Arbitrary Shape Interaction Between Conductors 	48
CHAPTER 5. CALCULATING THE POLARIZABILITY TENSOR	49
1. Calculating the Polarizability Tensor of a Solid body	49
2. The Polarizability Tensor of a Thin Metallic Screen 3. The Polarizability Tensors of a Flaky-Homogeneous Body	52
or a System of Bodies	53
4. Variational Principles for Polarizability	55

	Page
CHAPTER 6. ITERATIVE METHODS OF SOLVING SOME INTEGRAL EQUATIONS BASIC IN THE THEORY OF STATIC FIELDS: MATHEMATICAL RESULTS	63
 §1. Iterative Methods of Solving the Fredholm Equations of the Second Kind at a Characteristic Value §2. Iterative Processes for Solving Some Operator Equations §3. Iterative Processes for Solving the Exterior and Interior Boundary Value Problems §4. An Iterative Process for Solving the Fredholm Integral Equations of the First Kind with Pointwise Positive Kernel 	63 70 73
CHAPTER 7. WAVE SCATTERING BY SMALL BODIES	85
 §1. Introduction §2. Scalar Wave Scattering: The Single-Body Problem §3. Scalar Wave Scattering: The Many-Body Problem §4. Electromagnetic Wave Scattering §5. Radiation from Small Apertures and the Skin Effect for Thin Wires §6. The Inverse Problem of Radiation Theory 	85 86 92 97 104 109
PROBLEMS	113
BIBLIOGRAPHICAL NOTES	115
BIBLIOGRAPHY	117
LIST OF SYMBOLS	121