

Contents

Preface	vii
1 Scalars, Vectors, and Tensors	1
2 The Electrostatic Field	36
3 Special Methods for Solving Electrostatic Problems	53
4 Dielectrics	70
5 Energy and Mechanical Forces in the Electrostatic Field	83
6 Solutions of the Equations of Laplace and Poisson	93
7 The Special Theory of Relativity	126
8 The Magnetic Field	142
9 The Equations of Maxwell and the Wave Equations	155
10 Plane Electromagnetic Waves in Unbounded Media	176
11 Reflection and Refraction of Plane Waves	194
12 Spherical Electromagnetic Waves	212
13 Cylindrical Electromagnetic Waves	227
14 Cavity Resonators	234
15 Wave Guides	247
16 Lagrangian and Hamiltonian Formulations of the Electromagnetic Field	252
17 Electron Theory	271
Appendixes	
I Evaluation of the Integral	293
$I_1 = \iiint_{-\infty}^{+\infty} \frac{e^{i[k_1(x_1-x_1') + k_2(x_2-x_2') + k_3(x_3-x_3')]} dk_1 dk_2 dk_3}{k_1^2 + k_2^2 + k_3^2}$	
II Solution of the Wave Equations for the Electrodynamical Potentials	296
III Fundamental Constants	298
IV Conversion Table for Units	299
V Conversion Table for Symbols in Equations	301
Index	303