

# CONTENTS

	Page
<b>From the Preface to the First Edition</b> . . . . .	7
<b>Preface to the Second Edition</b> . . . . .	9
<b>Part I. Mechanics</b> . . . . .	11
Sec. 1. Generalized Coordinates . . . . .	11
Sec. 2. Lagrange's Equation . . . . .	13
Sec. 3. Examples of Lagrange's Equations . . . . .	24
Sec. 4. Conservation Laws . . . . .	30
Sec. 5. Motion in a Central Field . . . . .	41
Sec. 6. Collision of Particles . . . . .	48
Sec. 7. Small Oscillations . . . . .	57
Sec. 8. Rotating Coordinate Systems. Inertial Forces . . . . .	66
Sec. 9. The Dynamics of a Rigid Body . . . . .	73
Sec. 10. General Principles of Mechanics . . . . .	81
<b>Part II. Electrodynamics</b> . . . . .	92
Sec. 11. Vector Analysis . . . . .	92
Sec. 12. The Electromagnetic Field. Maxwell's Equations . . . . .	104
Sec. 13. The Action Principle for the Electromagnetic Field . . . . .	117
Sec. 14. The Electrostatics of Point Charges. Slowly Varying Fields . . . . .	124
Sec. 15. The Magnetostatics of Point Charges . . . . .	135
Sec. 16. Electrodynamics of Material Media . . . . .	144
Sec. 17. Plane Electromagnetic Waves . . . . .	162
Sec. 18. Transmission of Signals. Almost Plane Waves . . . . .	173
Sec. 19. The Emission of Electromagnetic Waves . . . . .	181
Sec. 20. The Theory of Relativity . . . . .	190
Sec. 21. Relativistic Dynamics . . . . .	211
<b>Part III. Quantum Mechanics</b> . . . . .	229
Sec. 22. The Inadequacy of Classical Mechanics. The Analogy Between Mechanics and Geometrical Optics . . . . .	229
Sec. 23. Electron Diffraction . . . . .	238
Sec. 24. The Wave Equation . . . . .	244



	Page
Sec. 25. Certain Problems of Quantum Mechanics . . . . .	252
Sec. 26. Harmonic Oscillatory Motion in Quantum Mechanics (Linear Harmonic Oscillator) . . . . .	265
Sec. 27. Quantization of the Electromagnetic Field . . . . .	271
Sec. 28. Quasi-Classical Approximation . . . . .	280
Sec. 29. Operators in Quantum Mechanics . . . . .	291
Sec. 30. Expansions into Wave Functions . . . . .	301
Sec. 31. Motion in a Central Field . . . . .	312
Sec. 32. Electron Spin . . . . .	323
Sec. 33. Many-Electron Systems . . . . .	334
Sec. 34. The Quantum Theory of Radiation . . . . .	353
Sec. 35. The Atom in a Constant External Field . . . . .	368
Sec. 36. Quantum Theory of Dispersion . . . . .	379
Sec. 37. Quantum Theory of Scattering . . . . .	385
Sec. 38. The Relativistic Wave Equation for an Electron . . . . .	394
<b>Part IV. Statistical Physics . . . . .</b>	<b>413</b>
Sec. 39. The Equilibrium Distribution of Molecules in an Ideal Gas . .	413
Sec. 40. Boltzmann Statistics (Translational Motion of a Molecule. Gas in an External Field) . . . . .	430
Sec. 41. Boltzmann Statistics (Vibrational and Rotational Molecular Motion) . . . . .	447
Sec. 42. The Application of Statistics to the Electromagnetic Field and to Crystalline Bodies . . . . .	457
Sec. 43. Bose Distribution . . . . .	474
Sec. 44. Fermi Distribution . . . . .	477
Sec. 45. Gibbs Statistics . . . . .	498
Sec. 46. Thermodynamic Quantities . . . . .	512
Sec. 47. The Thermodynamic Properties of Ideal Gases in Boltzmann Statistics . . . . .	535
Sec. 48. Fluctuations . . . . .	546
Sec. 49. Phase Equilibrium . . . . .	557
Sec. 50. Weak Solutions . . . . .	568
Sec. 51. Chemical Equilibria . . . . .	576
Sec. 52. Surface Phenomena . . . . .	582
<b>Appendix . . . . .</b>	<b>586</b>
<b>Bibliography . . . . .</b>	<b>588</b>
<b>Subject Index . . . . .</b>	<b>589</b>