Table of Contents

Part One Sentential Logic

Chapter One Introduction

1 Arguments 2
2 Contexts of Discovery and Justification 2
3 Deductive and Inductive Arguments 3
4 Argument Forms 5
5 Sentences and Propositions 7
6 Truth and Validity 7
7 Soundness 9

Chapter Two Sentential Logic—I

1 Atomic and Compound Sentences 10
2 Use of New Symbols 11
3 Conjunction 11
4 Variables and Constants 13
5 Sentences and Sentence Forms 15
6 Negation 15
7 Parentheses and Brackets 16
8 Disjunction 17
9 Material Implication 21
10 Material Equivalence 24

Chapter Three Sentential Logic—II

1 Truth Table Analysis 26
2 Tautologies, Contradictions, and Contingent Sentences 29
3 Symbolizing Compound Sentences 34

Chapter Four Sentential Logic—III

1 Arguments and Argument Forms 38
2 Valid Arguments and Argument Forms 39
3 Proofs Using Valid Argument Forms 42
4 Principles of Strategy 52
5 Common Errors in Problem Solving 56

Chapter Five Sentential Logic—IV

1 *Conditional Proofs* **62**
2 *Indirect Proofs* **67**
3 *Proving Argument Forms Invalid* **72**
4 *Proving Arguments Invalid* **72**
5 *Proving Premises Inconsistent* **77**
6 *Proving Premises Consistent* **79**
7 *Material Implication and Valid Argument Forms* **82**

Part Two Predicate Logic

Chapter Six Predicate Logic—I

1 *Individuals and Properties* **87**
2 *Quantifiers* **90**
3 *Proving Arguments Valid in Predicate Logic* **98**
4 *Symbolizing with Mixed Quantifiers* **104**

Chapter Seven Predicate Logic—II

1 *Rationale behind the Precise Formulation of the Quantifier Rules* **108**
2 *Precise Formulation of the Quantifier Rules* **118**
3 *Rule QN* **125**

Chapter Eight Predicate Logic—III

1 *Proving Invalidity* **130**
2 *Consistency and Inconsistency of Premises* **135**
3 *More Difficult Symbolizations* **136**

Chapter Nine Predicate Logic—IV

1 *Theorems of Logic* **146**
2 *Identity* **152**
3 *Proofs Involving Identity* **152**
4 *Symbolizing "At Least", "Exactly", "At Most", etc.* **153**
5 *Definite Descriptions* **156**
6 *Properties of Relations* **160**
7 *Higher Order Logics* **164**
8 *Limitations of Predicate Logic* **166**
9 *Philosophical Difficulties* **167**

Part Three Traditional Logic

Chapter Ten Definitions

1 *Introduction* **176**
2 *Lexical and Stipulative Definitions* **177**
3 *Intensional, Extensional, and Ostensive Definitions* **179**
4 *Criteria for Good Definitions* **181**
5 *Emotive Meaning* **185**

Chapter Eleven Traditional Syllogistic Logic—I

1 Introduction **188**
2 Four Kinds of Categorical Propositions **188**
3 Relation of Traditional Logic to Predicate Logic **189**
4 Existential Import **190**
5 Syllogistic Logic (Assuming Existential Import) **190**
6 Syllogistic Logic (Not Assuming Existential Import) **196**
7 More on Existential Import **198**
8 Continuation of Traditional Syllogistic Logic **199**

Chapter Twelve Traditional Syllogistic Logic—II

1 Syllogisms **204**
2 Proving Validity-Invalidity of Syllogisms **207**
3 Syllogistics Extended **218**
4 Enthymemes **223**
5 Sorites **225**
6 Technical Restrictions and Limitations **227**

Chapter Thirteen Fallacies

1 Definition of Fallacy **230**
2 Inconsistency **231**
3 Suppressed Evidence **233**
4 Doubtable Statement **234**
5 Ambiguity **235**
6 Two Wrongs Make a Right **236**
7 Appeal to Authority **236**
8 Begging the Question **237**
9 False Dilemma **238**
10 Straw Man **238**
11 Provincialism **239**
12 Ad Hominem Argument **239**
13 Hasty Conclusion **240**
14 Statistical Fallacies **241**
15 Some Other (Traditional) Fallacies **243**

Part Four Induction and Science

Chapter Fourteen Induction

1 Difference between Induction and Deduction **248**
2 Kinds of Inductive Arguments **251**
3 Cause and Effect **259**
4 Mill's Methods **261**

Chapter Fifteen Probability

1 Induction and Probability **266**
2 Two Related Problems about Probabilities **267**

3 *Meaning of the Term "Probability"* **267**
4 *The Calculation of Probabilities* **268**
5 *Comparison of the Classical and Frequency Theories* **270**
6 *Objections to the Classical and Frequency Theories* **271**
7 *A Joint Classical-Relative Frequency Theory* **276**
8 *Is There a Third Kind of Probability?* **277**
9 *The Probability Calculus* **277**

Chapter Sixteen *Confirmation, Explanation, Theories*

1 *Empirical Confirmation of Categorical Hypotheses* **282**
2 *Criteria for Confirmation Instances* **286**
3 *Criteria for Hypothesis Acceptance* **288**
4 *Statistical (Probability) Pattern of Confirmation* **289**
5 *Scientific Explanation* **290**
6 *Theories and Theoretical Entities* **294**
7 *The Justification of Induction* **296**

Part Five *Logic and Philosophy*

Chapter Seventeen *Some Recent Applications of Logic in Philosophy*

1 *Dispositionals* **303**
2 *Counterfactuals* **305**
3 *The Raven Paradox* **306**

Chapter Eighteen *Logical Paradoxes*

1 *Syntactic Paradoxes* **310**
2 *Semantic Paradoxes* **313**

Chapter Nineteen *Logic and a Traditional Problem in Philosophy*

1 *Introduction* **316**
2 *The A Priori and A Posteriori* **316**
3 *The Analytic and the Synthetic* **317**
4 *Semantic and Syntactic Analyticity* **318**
5 *The Synthetic A Priori* **318**
6 *Current Positions on the Analytic, Synthetic, A Priori, and A Posteriori* **320**
7 *The Use of Logic to Clarify the Problem* **322**

Part Six *Axiom Systems*

Chapter Twenty *Axiom Systems*

1 *The Nature of an Axiom System* **326**
2 *Interpreted and Uninterpreted Systems* **328**
3 *Properties of Axiom Systems* **329**

4 *Outline of an Axiom System for Sentential Logic* **333**
5 *Alternative Axiom Systems for Sentential Logic* **339**
6 *Axiom Systems for Predicate Logic* **340**
7 *Other Kinds of Axiom Systems* **342**
8 *Objections to Axiom Systems* **343**

Part Seven Modal, Epistemic, and Deontic Logic

Chapter Twenty-one Modal Logic

1 *Symbols and Expressions* **344**
2 *Strict Implication* **346**
3 *Modal Axioms* **348**
4 *Modal Theorems* **349**
5 *Modal Paradoxes* **350**
6 *A Philosophical Problem* **351**
7 *Modal Predicate Logic* **351**

Chapter Twenty-two Epistemic Logic: The Logic of Knowledge and Belief

1 *Predicate Logic Rules in Epistemic Contexts* **355**
2 *Epistemic Theorems* **357**

Chapter Twenty-three Deontic Logic

1 *A Typical Deontic Modal System* **359**
2 *Problems with Deontic Systems* **361**

Appendix A Elementary Intuitive Logic of Sets

1 *Introduction* **364**
2 *Basic Terms* **364**
3 *Translating Ordinary Language* **369**
4 *An Axiom System for the Algebra of Sets* **370**

Appendix B Alternative Set of Quantifier Rules

1 *Introduction* **372**
2 *Statement of the Alternative Set of Quantifier Rules* **373**
3 *Proofs Using the Alternative Quantifier Rules* **374**

Glossary **378**

Exercise Answers **395**

Bibliography **431**

Symbols **434**

Index **435**