# TABLE OF CONTENTS

## CHAPTER 1 COUNTING
1.1 the multiplication rule
1.2 permutations and combinations
1.3 permutations and combinations continued
1.4 permutations of not-all-distinct objects
1.5 committees with repeated members
1.6 ors
1.7 at leasts
1.8 review problems
1.9 binomial and multinomial expansions
1.10 partitions
review problems for Chapter 1

## CHAPTER 2 GRAPHS
2.1 terminology
2.2 Euler cycles and Euler paths
2.3 spanning trees
2.4 planar graphs
review problems for Chapter 2

## CHAPTER 3 GRAPH ALGORITHMS
3.1 Warshall's algorithm
3.2 Prim's algorithm
3.3 Dijkstra's algorithm
3.4 running times (time complexity) of algorithms
3.5 network flows
3.6 the matching algorithm
review problems for Chapter 3

## CHAPTER 4 RECURRENCE RELATIONS
4.1 setting up recurrence relations to do counting problems
4.2 solving homogeneous recurrence relations
4.3 solving nonhomogeneous recurrence relations
review problems for Chapter 4

## CHAPTER 5 FINITE STATE MACHINES AND REGULAR SETS
5.1 FSMS with outputs
5.2 FSMS with accepting states
5.3 nondeterministic FSMS
5.4 regular sets
5.5 Kleene's theorem part I
5.6 Kleene's theorem part II
5.7 some non-regular sets
review problems for Chapter 5

## CHAPTER 6 PROOFS BY INDUCTION AND RECURSION
6.1 proof by induction
6.2 proof by recursion

## CHAPTER 7 RELATIONS
7.1 introduction
7.2 partial orderings
7.3 equivalence relations

PLUS
SOLUTIONS
TO ALL
PROBLEMS