Contents

Preface

1	Introduction	1
	Mathematical Models	2
	Methods of Analysis	3
	Monetary Values	4
	Growth and Decay	4
	Discounted Cash Flow	5
	Sensitivity and Accuracy	7
	Straight Line Graphs	8
	Computer Program	11
	Summary	13
	Further Reading	13
	Exercises	14
Pá	art 1 Deterministic Models	15
2	Linear Programming	15
	Integer Programming	19
	The Simplex Method	22
	Computer Program	25
	Summary	27
	Further Reading	27
	Exercises	28
3	Transportation	29
_	Computer Program	39
	Summary	41
	Further Reading	42
	Exercises	42
4	Route Scheduling	44
	Minimal Spanning Trees	45
	The Travelling Salesman Problem	46
	Shortest Route Problems	54
	Computer Program	59
	Summary	62
	Further Reading	62
	Exercises	62

jii

139

140

140

Summary

Exercises

Further Reading

vi Contents

0	Stock Control	142
9	Deterministic Demand	142
	The Economic Order Quantity (EOQ)	143
	Stochastic Demand	145
	Re-Order Level (ROL) Systems	145
	Re-Order Cycle (ROC) Systems	149
	Simulation of Stock Control Systems	151
	Computer Program	154
	Summary	157
	Further Reading	157
	Exercises	158
	LACIONO	
10	Queues	160
	The Arrival Pattern	160
	Queue Discipline	161
	The Service Pattern	161
	Simple Queues	170
	The Negative Exponential Distribution	171
	Computer Program	174
	Summary	176
	Further Reading	177
	Exercises	177
	3 D 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	179
11	.	180
	Replacement	182
	Maintenance	185
	Reliability	185
	Systems With Constant Failure Rate	188
	Systems With Component Subsystems	194
	Computer Program	196
	Summary	197
	Further Reading	197
	Exercises	197
12	Forecasting	199
	Smoothing	200
	Time Series Decomposition	207
	Correlation and Regression	212
	Computer Program	217
	Summary	219
	Further Reading	220
	Exercises	220
	<u> </u>	
13	•	222
	Commercial Computing	222
	Scientific Computing	222
	Computers and Operational Research	223
	Computer Program	231

	Contents vi
Summary	234
Further Reading	234
Exercises	235
Bibliography	236
Answers to Exercises	239
Index	241