

## TABLE OF CONTENTS

<u>Section</u>	<u>Description</u>	<u>Page</u>
	PREFACE . . . . .	III
	LIST OF TABLES AND FIGURES . . . . .	VII
1.0	INTRODUCTION . . . . .	1
2.0	BASIC EXAMPLES AND MOTIVATION . . . . .	6
2.1	A Single-Server Queue . . . . .	6
2.2	An Inventory System . . . . .	16
2.3	A Repairman Model . . . . .	21
2.4	Concluding Remarks . . . . .	27
3.0	THE REGENERATIVE METHOD . . . . .	29
3.1	Regenerative Processes in Discrete Time . . . . .	30
3.2	Regenerative Processes in Continuous Time . . . . .	36
3.3	Confidence Intervals . . . . .	39
3.4	Sample Simulation Results for Models of Section 2 . . . . .	47
3.5	Tactical Questions . . . . .	53
3.6	Cost Structures . . . . .	57
3.7	Conditions Insuring Steady-State Distributions . . . . .	59
4.0	MORE EXAMPLES OF REGENERATIVE PROCESSES . . . . .	62
4.1	An Inventory Distribution Model . . . . .	62
4.2	Particles-in-a-Box Markov Chain . . . . .	67
4.3	A Markov Chain with a Random Time Clock . . . . .	69

## TABLE OF CONTENTS (Cont'd)

<u>Section</u>	<u>Description</u>	<u>Page</u>
5.0	THE REGENERATIVE APPROACH AND DISCRETE-EVENT SIMULATIONS . . . . .	72
5.1	Estimating Steady-State Queue-Length Using Event Times . . . . .	72
5.2	Application to Discrete-Event Simulations . . . . .	77
6.0	APPROXIMATION TECHNIQUES . . . . .	82
6.1	Approximate Regeneration . . . . .	84
6.2	Partial State-Space Discretization . . . . .	88
6.3	Concluding Remarks . . . . .	91
7.0	ALTERNATIVE RATIO ESTIMATORS . . . . .	92
8.0	SOME OTHER RESULTS . . . . .	99
8.1	Selecting the Best System . . . . .	99
8.2	Quantile Estimation . . . . .	100
8.3	Sensitivity Analysis: A Polynomial Approximation Technique . . . . .	101
8.4	Discrete Time Methods for Continuous Time Processes . . . . .	102
8.5	Stopping Rules for Regenerative Simulations . . . . .	103
8.6	Variance Reduction for Regenerative Simulations . . . . .	106
9.0	BIBLIOGRAPHIC NOTE . . . . .	107
	REFERENCES . . . . .	109