

# CONTENTS

CHAPTER	TITLE	PAGE NO.
<b>I</b>	<b>INTRODUCTION</b>	<b>1</b>
	1.1 CHARACTERISTICS OF QUEUEING PROCESSES	1
	1.2 REVIEW OF LITERATURE	9
	1.3 THESIS ORGANIZATION	19
	1.4 OBJECTIVES AND SCOPE OF RESEARCH WORK	23
	1.5 METHODOLOGY	24
	1.6 PRELIMINARIES	26
<b>II</b>	<b>THE (m, N) POLICY FOR A REPAIRABLE BULK ARRIVAL QUEUEING MODEL WITH SECOND MULTI-OPTIONAL SERVICE FACILITY UNDER J-VACATION POLICY</b>	<b>29</b>
	2.1 MATHEMATICAL ANALYSIS OF THE SYSTEM	31
	2.2 OPTIMAL MANAGEMENT POLICY	56
	2.3 PARTICULAR CASES	59
	2.4 NUMERICAL ANALYSIS	61
<b>III</b>	<b>THE (m, N) POLICY FOR A REPAIRABLE BATCH ARRIVAL SINGLE SERVICE QUEUEING SYSTEM WITH DISTINCT BEHAVIOUR OF SERVICE INTERRUPTED CUSTOMERS UNDER J-VACATION POLICY</b>	<b>70</b>
	3.1 MATHEMATICAL ANALYSIS OF THE SYSTEM	71
	3.2 OPTIMAL MANAGEMENT POLICY	85
	3.3 PARTICULAR CASES	87
	3.4 NUMERICAL ANALYSIS	88

CHAPTER	TITLE	PAGE NO.
IV	<b>THE (m, N) POLICY FOR A REPAIRABLE BATCH ARRIVAL QUEUE WITH A SECOND OPTIONAL SERVICE CHANNEL UNDER DIFFERENT TYPES OF BERNOULLI SINGLE VACATIONS</b>	95
	4.1 MATHEMATICAL ANALYSIS OF THE SYSTEM	96
	4.2 OPTIMAL MANAGEMENT POLICY	116
	4.3 PARTICULAR CASES	118
	4.4 NUMERICAL ANALYSIS	119
V	<b>THE (m, N) POLICY FOR <math>M^X/G/1</math> QUEUEING SYSTEM WITH OPTIONAL RE-SERVICES UNDER RANDOMIZED VACATION POLICY DURING IDLE PERIOD AND OPTIONAL SINGLE VACATION DURING BUSY PERIOD</b>	125
	5.1 MATHEMATICAL ANALYSIS OF THE SYSTEM	125
	5.2 OPTIMAL MANAGEMENT POLICY	143
	5.3 PARTICULAR CASES	145
	5.4 NUMERICAL ANALYSIS	146
VI	<b>QUEUE LENGTH ANALYSIS OF UNRELIABLE <math>M^X/(G_1, G_2)/1</math> FEEDBACK QUEUE WITH TWO PHASE SERVICES, SETUP, OPTIONAL SERVER VACATION, DELAYED REPAIR, UNDER MULTIPLE ADAPTED VACATION POLICY DURING IDLE PERIOD</b>	152
	6.1 MATHEMATICAL ANALYSIS OF THE SYSTEM	153
	6.2 PARTICULAR CASES	170
	6.3 NUMERICAL ANALYSIS	172
VII	<b>REPAIRABLE TWO PHASE SERVICE <math>M^X/G/1</math> QUEUEING MODELS WITH FINITE NUMBER OF IMMEDIATE FEEDBACKS UNDER BERNOULLI SCHEDULE VACATION</b>	177
	7.1 $M^X/G/1$ QUEUE WITH FINITE NUMBER OF FEEDBACKS AND RESUMPTION OF INTERRUPTED SERVICE	178
	7.1.1 MATHEMATICAL ANALYSIS OF THE SYSTEM	178

CHAPTER	TITLE	PAGE NO.
7.2	M <sup>x</sup> /G/1 QUEUE WITH FINITE NUMBER OF FEEDBACKS AND REPETITION OF INTERRUPTED SERVICE	190
7.2.1	MATHEMATICAL ANALYSIS OF THE SYSTEM	190
7.2.2	PARTICULAR CASE	194
<b>VIII</b>	<b>REPAIRABLE TWO PHASE SERVICE M<sup>x</sup>/G/1 QUEUEING MODELS WITH INFINITE NUMBER OF IMMEDIATE FEEDBACKS UNDER BERNOULLI SCHEDULE VACATION</b>	<b>195</b>
8.1	M <sup>x</sup> /G/1 QUEUE WITH INFINITE NUMBER OF FEEDBACKS AND RESUMPTION OF INTERRUPTED SERVICE	196
8.1.1	MATHEMATICAL ANALYSIS OF THE SYSTEM	196
8.1.2	PARTICULAR CASES	210
8.2	M <sup>x</sup> /G/1 QUEUE WITH INFINITE NUMBER OF FEEDBACKS AND REPETITION OF INTERRUPTED SERVICE	212
8.2.1	MATHEMATICAL ANALYSIS OF THE SYSTEM	212
8.2.2	PARTICULAR CASES	216
8.3	NUMERICAL ANALYSIS	217
	<b>CONCLUSION</b>	<b>220</b>
	<b>REFERENCES</b>	<b>223</b>
	<b>APPENDICES</b>	<b>233</b>
	<b>LIST OF PUBLICATIONS</b>	<b>239</b>