

TABLE OF CONTENTS

	Page
TABLE OF CONTENTS	i
LIST OF TABLES	ii
LIST OF FIGURES	iv
INTRODUCTION	1
OBJECTIVES	5
LITERATURE REVIEW	6
MATERIALS AND METHODS	17
Materials	17
Methods	17
RESULTS AND DISCUSSION	53
CONCLUSION AND RECOMMENDATION	74
Conclusion	74
Recommendation	76
LITERATURE CITED	77
APPENDICES	86
Appendix A Example of solving SKPDRC	87
Appendix B Example of solving SKPCRC	102

LIST OF TABLES

Table		Page
1	Computing time (sec) of the algorithm 1 of SKPDRCR	54
2	Computing time (sec) of the algorithm 2 of SKPDRCR	54
3	Computing time (sec) of the general purpose method using CPLEX for solving SKPDRCR	55
4	The best algorithm for solving SKPDRCR (Algorithm1 (I), Algorithm2 (II), CPLEX (III))	56
5	The ratios of computing time of the algorithm 2 of SKPDRCR divided by computing time of the general purpose method using CPLEX for solving SKPDRCR	57
6	Computing time (sec) of the proposed heuristic for SKPDRC where the relaxed problem was solved by using the algorithm 2 of SKPDRCR	59
7	Computing time (sec) of the general purpose method using CPLEX for solving SKPDRC	60
8	The ratios of computing time of the proposed heuristic for SKPDRC, where the relaxed problem was solved by using the algorithm 2 of SKPDRCR, divided by computing time of the general purpose method using CPLEX for solving SKPDRC	61
9	Percent Win/Tie/Lose of the objective values of the proposed heuristic for SKPDRC compared with the general purpose method using CPLEX	62
10	Computing time (sec) of the algorithm 1 (or algorithm 2) and the Monte Carlo Simulation for solving SKPCRCR	64
11	Computing time (sec) of the proposed heuristic for SKPCRC where the relaxed problem was solved by using the algorithm 1 (or algorithm 2) and the Monte Carlo simulation of SKPCRCR	65
12	Percent of Win/Tie/Lose of the objective values of SKPCRCR by using the algorithm 1(or algorithm 2) of SKPCRCR compared with the Monte Carlo simulation of SKPCRCR	67

LIST OF TABLES (Continued)

Table		Page
13	Percent Win/Tie/Lose of the objective values of SKPCRC where the relaxed problem was solved by the algorithm 1 (or algorithm 2) of SKPCRCR compared with the objective values of SKPCRC where the relaxed problem was solved by the Monte Carlo simulation of SKPCRCR.	68
14	Average absolute percent error of the objective values of SKPCRCR by using the algorithm 1 (or algorithm 2) of SKPCRCR compared with the Monte Carlo simulation of SKPCRCR	69
15	Average absolute percent error of objective values of SKPCRC where the relaxed problem was solved by the algorithm 1 (or algorithm 2) of SKPCRCR compared with average absolute percent error of the objective values of SKPCRC where the relaxed problem was solved by Monte Carlo simulation of SKPCRCR	70
16	Summary of the algorithm 1 (or algorithm 2) of SKPCRCR with appropriate ΔB compared with the Monte Carlo simulation for solving SKPCRCR	71
17	Summary of the proposed heuristic where the relaxed problem was solved by using the algorithm 1 (or algorithm 2) of SKPCRCR with appropriate ΔB compared with the proposed heuristic where the relaxed problem was solved by using the Monte Carlo simulation	72

LIST OF FIGURES

Figure		Page
1	Graph of $H_1(\theta)$ of SKPDRCR	27
2	Graph of $H_2(\theta)$ of SKPDRCR	28
3	Graph of $H_1(\theta)$ of SKPCRCR	43
4	Graph of $H_2(\theta)$ of SKPCRCR	44
5	Heuristic for SKPDRC	50
6	Heuristic for SKPCRC	51