

CONTENTS

APPROVAL	ii
SELF DECLARATION AGAINST PLAGIARISM	iv
ABSTRACT	v
CONTENTS	vi
DEDICATION	viii
ACKNOWLEDGMENTS	ix
PREFACE	xi
LIST OF TABLES	xii
LIST OF FIGURES	xiii
LIST OF ACHIEVEMENTS	xv
1 INTRODUCTION	1
1.1 Background	1
1.2 Problem Identification	2
1.3 Objectives	3
1.4 Scope of Work	4
1.5 Expected Results	4
1.6 Research Methodology	4
2 BASIC CONCEPT	6
2.1 Coded Random Access	6
2.2 Repetition Codes	7
2.3 Successive Interference Cancellation Decoding Algorithm	8
2.4 Stopping Sets Problem	9
2.5 Zigzag Decodable Codes	12
2.6 Extrinsic Information Transfer (EXIT) Chart	13

3 SYSTEM MODEL AND THE PROPOSED MULTIPLE ACCESS TECHNIQUE	14
3.1 Transmitter	14
3.2 Channel	15
3.2.1 Additive White Gaussian Noise (AWGN)	15
3.2.2 Binary Erasure Channel	16
3.3 Receiver	17
3.4 System Model with Prioritization	17
3.5 Optimization Algorithm	18
3.6 System Verification	20
4 PERFORMANCE ANALYSIS	24
4.1 Stopping Set Analysis	24
4.2 Packet Loss Rate Comparison SIC and SIC+ZDC	27
4.3 Throughput Comparison SIC and SIC + ZDC	36
5 CONCLUSIONS	41
5.1 Conclusions	41
REFERENCES	42
6 Appendix	44
6.1 PLR Comparison SIC and SIC + ZDC	44
6.2 Throughput Comparison SIC and SIC + ZDC	73