CONTENTS

CHAPTER			PAGE NO.
		PREFACE	
		ACKNOWLEDGMENTS	
		SUMMARY AND CONCLUSIONS	1
		NOMENCLATURE	10
		LIST OF TABLES	13
		LIST OF FIGURES	17
I		INTRODUCTION	21
II		LITERATURE SURVEY	25
	2.1	MULTIPHASE FLOW THROUGH CHOKES	25
	2.1.1.	THEORETICAL CORRELATIONS	25
	2.1.2	EMPIRICAL CORRELATIONS	36
	2.2	SYSTEM ANALYSIS-CHOKE SIZE SELECTION	38
	2.3	VERTICAL FLOW CORRELATIONS	39
	2.4	COMMINGLING FLOW	40
	2.5	CRITICAL REVIEW	42
	2.5.1	PERFORMANCE OF SURFACE CHOKE	42
	2.5.2	PERFORMANCE OF BOTTOMHOLE CHOKE	43
	2.5.3	COMMINGLING FLOW	43
III		MODEL DEVELOPMENT	44
	3.1	INTRODUCTION	44
	3.2	THEORETICAL CONSIDERATIONS	44
	3.3	DERIVATION OF THEORETICAL MODEL	45
IV	4	PERFORMANCE OF SURFACE CHOKE	52
	4.1	INTRODUCTION	52
	4.2	TYPES AND CONTROL OF FLOWING WELLS	52
	4.3	EXPERIMENTAL	53
	4.3.1	TEST PROCEDURE	57
	4.4	RESULTS AND DISCUSSIONS	58
	4.4.1	PERFORMANCE OF SURFACE CHOKE	59
	4.4.2	RELIABILITY ANALYSIS	60
	4.4.2.1	AVERAGE PERCENT RELATIVE ERROR	60
	4.4.2.2	AVERAGE ABSOLUTE PERCENT RELATIVE ERROR	60
	4.4.23	MINIMUM/MAXIMUM ABSOLUTE PERCENT RELATIVE ERROR	61
	4.4.2.4	STANDARD DEVIATION	61
	4.4.2.5	CORRELATIONS COEFFICIENT	61

CHAPTER		CONTENTS	PAGE NO
	4.4.2.6	COMPUTATION	62
	4.4.3	COMPARISON OF EMPIRICAL CORRELATIONS	62
	4.4.4	EVALUATION OF THE THEORETICAL MODEL	63
	4.4.4.1	DETERMINATION OF DISCHARGE COEFFICIENT	64
	4.4.4.2	STATISTICAL ANALYSIS	65
	4.4.5	EVALUATION OF OTHER MODELS	65
	4.5	CONCLUSIONS	67
		TABLES	68
		FIGURES	109
V		PERFORMANCE OF BOTTOMHOLE CHOKE	123
	5.1	INTRODUCTION	123
	5.2	THEORETICAL CONSIDERATIONS	123
	5.2.1	BOTTOMHOLE CHOKE SIZE SELECTION	124
	5.2.2	THE WORK POTENTIAL OF GAS	125
	5.3	EXPERIMENTAL	127
	5.3.1	TEST PROCEDURE	129
	5.4	RESULTS AND DISCUSSIONS	132
	5.4.1	PERFORMANCE OF BOTTOMHOLE CHOKE	132
	5.4.1.1	EVALUATION OF THE THEORETICAL MODEL	134
	5.4.1.2	DETERMINATION OF DISCHARGE COEFFICIENT	134
	5.4.1.3	STATISTICAL ANALYSIS	135
	5.4.1.4	EVALUATION OF OTHER MODELS	135
	5.4.2	COMPARISION OF BOTTOMHOLE CHOKE PRODUCTION SYSTEM WITH THAT OF SURFACE CHOKE	136
	5.4.2.1	PRODUCTIVITY INDEX	137
	5.4.2.2	PRESSURE DROP PER TON OF OIL PRODUCTION	139
	5.4.2.3	CONSUMPTION OF ENERGY POTENTIAL IN LIFTING UNIT MASS OF OIL	140
	5.5	BOTTOMHOLE CHOKE SIZE SELECTION	140
	5.6	CONCLUSIONS	143
		TABLES	145
		FIGURES	175
VI		COMMINGLING FLOW	202
	6.1	INTRODUCTION	202
	6.2	THEORETICAL CONSIDERATIONS	202
	6.2.0	COMMINGLING FLOW	202
	6.2.1	MODIFIED COMMINGLING FLOW	205
	6.2.2	MIXING OF TWO IDEAL GAS STREAMS	207
	6.3	MODELING OF COMMINGLING FLOW WITH BOTTOMHOLE CHOKE	210

CHAPTER	CONTENTS	PAGE NO
6.4	EXPERIMENTAL	213
6.5	RESULTS AND DISCUSSION	215
6.5.1	COMMINGLING CHOKE SIZE SELECTION	216
6.6	CONCLUSIONS	218
	TABLES	219
	FIGURES	231
SCOPE FOR FUTURE WORK		243
REFERENCES		244
APPENDIX - I	COMPUTER PROGRAMS OF CHAPTER - IV	
APPENDIX - II	COMPUTER PROGRAM OF CHAPTER - V	
APPENDIX - III	COMPUTER PROGRAM OF CHAPTER - VI	