

C O N T E N T S

Chapter	Section	Page No
1	INTRODUCTION	1
	1.1 INTRODUCTION	2-19
	1.2 CONCLUSION	20
2	PRELIMINARIES	21
	2.1 INTRODUCTION	22
	2.2 CATCHMENT AREA USED IN ANALYSIS	22
	2.3 DEFINITION OF WEATHER AND CLIMATE	23-25
	2.4 FORMULATION OF PREDICTION PROBLEM	25-29
	2.5 ARTIFICIAL NEURAL NETWORK (ANN)	29-47
	2.6 FOURIER SERIES FOR ONE VARIABLE	47-50
	2.7 DOUBLE FOURIER SERIES (DFS)	51-59
3	PREDICTION OF WEEKLY SOIL TEMPERATURES BY HARMONIC ANALYSIS AND ARTIFICIAL NEURAL NETWORKS	60
	3.1 INTRODUCTION	61-63
	3.2 PROBLEM FORMULATION	63-64
	3.3 PREDICTION OF SOIL TEMPERATURE BY ANN USING 3-INPUTS AND 3-OUTPUTS	64-67

3.4	METHOD II: NEURAL NETWORK APPROACH (MCCULLOCH TYPE NEURONS)	68-77
3.5	METHOD III: PREDICTION OF ST BY THREE INPUTS USING MULTILAYERED ANN	78-79
3.6	I CASE (b) PREDICTION OF ST BY TWO INPUTS USING MULTILAYERED ANN	79-82
3.7	I CASE (c) PREDICTION OF ST BY ONE VARIABLE, (TIME) USING (ANN) WITH BACKPROPAGATION ALGORITHM	82-94
3.8	SOIL TEMPERATURE PREDICTION BY HARMONIC ANALYSIS	94-120
3.9	CONCLUSION	120
4	RAINFALL PROBABILITY ANALYSIS BY GAMMA, GUMBEL AND FISHER TIPETT TYPE-II DISTRIBUTIONS AND ARTIFICIAL NEURAL NETWORKS	121
4.1	INTRODUCTION	122-124
4.2	PROBLEM FORMULATION	124-128
4.3	DETAILS OF THE FIRST PROBLEM : RTPA	128-156
4.4	SECOND PROBLEM	156-171
4.5	CONCLUSION FOR USED TWO METHODS	171
5	PREDICTION OF ANNUAL RAINFALL BY DOUBLE FOURIER SERIES AND ARTIFICIAL NEURAL NETWORKS	172
5.1	INTRODUCTION	173

3.4	METHOD II: NEURAL NETWORK APPROACH (MCCULLOCH TYPE NEURONS)	..... ..	68-77
3.5	METHOD III: PREDICTION OF ST BY THREE INPUTS USING MULTILAYERED ANN	..... ..	78-79
3.6	I CASE (b) PREDICTION OF ST BY TWO INPUTS USING MULTILAYERED ANN	..... ..	79-82
3.7	I CASE (c) PREDICTION OF ST BY ONE VARIABLE, (TIME) USING (ANN) WITH BACKPROPAGATION ALGORITHM	..... ..	82-94
3.8	SOIL TEMPERATURE PREDICTION BY HARMONIC ANALYSIS	..... ..	94-120
3.9	CONCLUSION	..... ..	120
4	RAINFALL PROBABILITY ANALYSIS BY GAMMA, GUMBEL AND FISHER TIPETT TYPE-II DISTRIBUTIONS AND ARTIFICIAL NEURAL NETWORKS	..... ..	121
4.1	INTRODUCTION	..... ..	122-124
4.2	PROBLEM FORMULATION	..... ..	124-128
4.3	DETAILS OF THE FIRST PROBLEM : RTPA	..... ..	128-156
4.4	SECOND PROBLEM	..... ..	156-171
4.5	CONCLUSION FOR USED TWO METHODS	..... ..	171
5	PREDICTION OF ANNUAL RAINFALL BY DOUBLE FOURIER SERIES AND ARTIFICIAL NEURAL NETWORKS	..... ..	172
5.1	INTRODUCTION	..... ..	173

5.2	PROBLEM FORMULATION	.....	173-186
5.3	DATA	.... .	186-188
5.4	DOUBLE FOURIER SERIES	.. ....	188-195
5.5	ARTIFICIAL NEURAL NETWORK (ANN) APPROACH	.....	195-202
5.6	COMPARISON OF THE RESULTS BY TWO METHODS DFS AND ANN	.....	202-203
5.7	CONCLUSION	.....	203
6	ESTIMATION OF HOURLY AIR TEMPERATURES BY WILLIAM AND LOGAN MODEL, DOUBLE FOURIER SERIES AND ARTIFICIAL NEURAL NETWORKS	.....	204
6.1	INTRODUCTION	.....	205-206
6.2	PROBLEMS FORMULATION	.....	206-212
6.3	CASE (II)	.....	212-219
6.4	DATA	.....	219-220
6.5	DETAILS OF THE METHODS AND RESULTS	.....	220-236
6.6	COMPARISONS OF THE USED FOUR METHODS	.....	236-237
7	CONCLUDING REMARKS	.....	238-242
	APPENDIX	.....
	BIBLIOGRAPHY	.....