# CONTENTS

## CHAPTER - I

1.1 What is Pattern Recognition  
1.2 Applications Of Pattern Recognition  
1.3 Basic Concepts Of Pattern Recognition  
1.4 Fundamental Problems In Pattern Recognition System Design  
1.5 An Application - Character Recognition  
1.6 The Problem  
1.7 A Brief Overview Of The Following Chapters

## CHAPTER - II

2.1 Introduction  
2.2 Literature Survey

## CHAPTER - III

3.1 Introduction  
3.2 Properties Of Characters  
3.3 The size Of The Character Matrix  
3.4 The Binary Image  
3.5 Vocabulary  
3.5.1 Basic Vectors/Basic Polynomials  
3.5.2 Number Of Basic Vectors/basic Polynomials  
3.5.3 Properties Of Circular Vectors/Polynomials
3.5.3a Transpose 46
3.5.3b Reverse Video 47
3.5.3c Symmetry 47
3.5.3d Hex Representation 48
3.5.3e Reduction Of Higher Order Polynomial To Lower Order Polynomial 49
3.5.3f Approximation 49
3.6 Labeling Of Words 49

CHAPTER - IV

4.1 Introduction 61
4.2 Problem Formulation 61
4.3 Features For The Class Of Images Treated 67

CHAPTER - V

5.1 Introduction 73
5.2 Filtering Preliminaries 73
5.3 Definitions 75
5.4 Filtering Procedure 79
5.5 Evaluation Of Preservation Measure 90
5.5.1 Cell Occupancy Measure - P1 94
5.5.2 Redundancy measure - P2 94
5.5.3 Contour Retention Measure - P3 94
5.5.4 Transpose Preservent Measure - P4 94
7.4  Rules Adopted For Character Description 125
7.4.1 Generation Character Description 126
7.5  Illustrations Of Character Descriptions 127
7.6  Open - Ended Inventories 128
7.7  Character Classification scheme 134
7.8  The Decision Tree 135
7.8.1 Interaction Amongst Scanning, Primitive Extraction and Character Classification 140
7.10  Computer Implementation Of The Proposal 142
7.11  Realisation Of The Decision Tree 148
7.12  Graphical Representation Of The Decision Tree 149
7.13  Conventions Adopted For Character Scanning 150
7.14  Additional Branches In The Decision Tree 152
7.15  Recognition Of The Character Variants Without Altering The Decision Tree 152

CHAPTER - VIII
8.1  Summary 157
8.2  Results Of The Thesis 161
8.3  Suggestions For Future Work And The Range Of The Current work 163

REFERENCES 165