CONTENTS

Chapter No	Title	Page No.
I	**INTRODUCTION**	1
1.1	General	1
1.2	Review of Literature	2
1.3	Statement of the Problem	4
1.4	About the Dissertation	5
	References	6
II	**THEORETICAL BACKGROUND**	9
2.1	Introduction	9
2.2	Basic DC Motor	11
	2.2.1 Construction of DC Motor	11
	2.2.2 Significance of Back EMF	12
	2.2.3 Voltage Equation of Motor	13
	2.2.4 Torque	13
	2.2.5 Armature Torque of Motor	14
	2.2.6 Speed of DC Motor	15
	2.2.7 Speed Regulation	15
	2.2.8 Torque and Speed of DC Motor	15
2.3	Types of DC Motors	16
	2.3.1 Separately Excited Dc Motor	16
	2.3.2 Series Motor	18
	2.3.3 Shunt Motor	22
	2.3.4 Compound Motor	23

III	**SYSTEM DESIGN**	**26**
3.1	Introduction	26
3.2	System Block Diagram	27
3.3	Hardware Description	29
	3.3.1 Interfacing Card	29
	3 3.1.1 Analog Input Connection	30
	3.3.1.2 Analog Output Connection	30
	3.3.1.3 Base Address Selection	30
	3.3.2 Signal Conditioning Card	32
	3.3.2.1 Current Sensing Circuit	32
	3.3.2.2 Speed sensing	34
	3.3.2.3 Voltage Measurement	36
3.4	Chopper Circuit	37
IV	**SOFTWARE DEVELOPMENT AND CALIBRATION OF THE SYSTEM**	**39**
4.1	Introduction	39
4.2	Guidelines Used While Developing thr Software	39
4.3	Program Development	40
	4.3.1 Main Program	40
	4.3.2 Input Module	42
	4.3.2.1 A/D Data Registers	42
	4.3.2.2 MUX Scan Register	43
	4.3.2.3 A/D Data Transfer	43
	4.3.2.4 Execute an A/D Conversion	44
	4.3.3 Computational Module	45
	4.3.4 Display Module	48

4.4	Calibration of the system	48
	4.4.1 Voltage calibration	50
	4.4.2 Current calibration	50
4.5	Determination of motor parameters	55
	Program listing	57
V	**RESULTS AND DISCUSSION**	**68**
5.1	Introduction	68
5.2	Theoretical performance of DC motor	68
	5.2.1 Speed Current Characteristics	69
	5.2.2 Speed Torque Characteristics	69
	5.2.3 Torque Current Characteristics	69
5.3	Practical Performance	68
5.4	Comparison of Results	75
VI	**SUMMERY AND CONCLUSION**	81