## TABLE OF CONTENTS

CHAPTER ONE: REVIEW OF THE LITERATURE	PAGE NUMBER
1.1 INTRODUCTION	1
1.2 CONSTRUCTION OF KNITTED FABRICS	1
1.3 KNITTING MACHINERY	5
1.4 DESCRIPTION OF THE KNITTING ACTION OF LA	TCH NEEDLE 10
1.5 SINGLE JERSEY CHARACTERISTICS	12
1.6 1X1 RIB CHARACTERISTICS	13
1.7 STRUCTURAL ISSUE RELATED TO SINGLE JERSI	EY & 1X1 RIB 13
CHAPTER TWO: GEOMETRY OF PLAIN KNITTED FABR	RIC
2.1 INTRODUCTION	15
2.2 GEOMETRY OF PLAIN KNITTED FABRIC	15
CHAPTER THREE: DESIGN OF EXPERIMENTAL WORK	-
CHAPTER THREE: DESIGN OF EXPERIMENTAL WORK	
3.1 INTRODUCTION	29
3.2 MATERIALS USED	29
3.3 KNITTING MACHINE	30
3.4 EXTENSIBILITY MEASUREMENT	30
3.5 AIR PERMEABILITY MEASUREMENT	30
3.6 ABRASION RESISTANCE MEASUREMENT	32
3.7 FABRIC THICKNESS MEASUREMENT	32
3.8 PORE SIZE MEASUREMENT	33
CHAPTER FOUR: RESULTS AND DISCUSSION	
4.1 INTRODUCTION	2.4
	34 EDIGELOG 24
4.2 EFFECT OF KNIT COUNT ON FABRIC CHARACTE	
4.2.1 STITCH LENGTH	34
4.2.2 KNITTED FABRIC EXTENSIBILITY	37
4.2.3 AIR PERMEABILITY	37
4.2.4 ABRASION RESISTANCE	38
4.2.5 FABRIC THICKNESS	40

4.2.6 PORE SIZE 4.3 EFFECT OF KNITTED CONSTRUCTION FACTORS ON PORE S	42 SIZE 43
CHAPTER FIVE: CONCLUSION AND RECOMMENDATION FOR ISTUDY	FUTURE
<ul><li>5.1 CONCLUSION</li><li>5.2 RECOMMENDATIONS FOR FUTURE STUDY</li></ul>	46 50
REFERENCES	51

## LIST OF TABLES

Table (1.1) Structural issue of single jersey and 1X1 rib fabrics	14
Table (2.1) Estimation of length of yarn per loop (grey fabrics)	23
Table (3.1) Specifications of the yarn used	29
Table (3.2) Specifications of the knitted fabrics	30
Table (4.1) Stitch length values	35
Table (4.2) Stitch density values	35
Table (4.3) Percentage weight loss for the three fabric samples	39
Table (4.4) Thickness values structural parameters for the three samples	40
Table (4.5) Fabric tightness factor $(l/d)$	41
Table (4.6) Calculated pore size values	43

## LIST OF FIGURES

Figure (1.1) Types of needles used on knitting machines	2
Figure (1.2) Most common woven fabrics	2
Figure (1.3) Weft knitting	3
Figure (1.4) Warp knitting	3
Figure (1.5) Interpenetrating loops	3
Figure (1.6) Loop formation on weft knitting	5
Figure (1.7) Circular jersey knitting machine	6
Figure (1.8) Needles arrangement on circular knitting machine	6
Figure (1.9) Needles arrangement on rib machine	7
Figure (1.10) Needles arrangement on purl machine	8
Figure (1.11) Lengthwise knitting direction	8
Figure (1.12) Warp knitting machine (Karl Mayer)	8
Figure (1.13) Knitting sequence of the latch needle	10
Figure (1.14) Single jersey	11
Figure (1.15) 1X1 rib structure	12
Figure (2.1) Geometry of plain knitted fabric	15
Figure (2.2) The planed structure of Peirce's loop	16
Figure (2.3) Model of plain knitted structure	17
Figure (2.4) Projection of the new loop on the plane of fabric	19

Figure (2.5) Three dimensional view of fabric	19
Figure (2.6) Relation between stitch length and stitch density	20
Figure (3.1) Diagrammatic representation of air permeability tester	28
Figure (4.1) The effect of the input tension on stitch length	31
Figure (4.2) The effect of the input tension on stitch density	31
Figure (4.3) The effect of stitch density on fabric extensibility	33
Figure (4.4) The effect of stitch density on air permeability	34
Figure (4.5) Abrasion resistance for the knitted fabric samples	35
Figure (4.6) The effect of stitch density on fabric thickness	36
Figure (4.7) Schematic representation of a plain weft knitted structur	re 38
Figure (4.8) Calculated pore size for the knitted fabric samples	38
Plate (4.1) Sample 1	39
Plate (4.2) Sample 2	39
Plate (4.3) Sample 3	40