SR. **FIGURE** PAGE FIGURE DESCRIPTION *NO*. NO. NO. 2.1 7 1 Polymer-based classification of textile fibres 2.2 9 2 Cellulose's chemical composition and arrangement in fibre Cellulose crystals are created when cellulose fibres are dissolved 2.3 10 3 in acid 4 2.4 10 Cotton's morphological structure 17 5 2.5 Sheet made of wood pulp 2.6 Viscose rayon manufacturing process phases 18 6 7 2.7 Airtight hexagonal churns 19 2.8 20 8 Reaction sequence in the production of viscose rayon 9 2.9 29 Enzymatic hydrolysis of starch 10 2.10 66 Mechanism of Enzyme 11 2.11 *Enzyme – Substrate Complex Theory* 66 2.12 70 12 Hydrolysis up to single glucose unit with Glucoamylase enzyme 13 2.13 Crystalline and amorphous region in polymer 72 Representation of Isotactic, Syndiotactic and Atactic polymer 14 2.14 74 respectively 15 3.1 Motor for Mixing with speed controller 80 3.2 16 81 *Electric heating mantle* 17 3.3 Schematic process diagram of formulation EDA 82 18 3.4 Structure of polymer 83 19 3.5 84 Schematic process diagram of formulation PWA 84 20 3.6 Analab scientific pH Analyzer 3.7 85 21 Brookfield viscometer RVT model 22 3.8 85 Hydrometer set up for specific gravity 23 3.9 Petri-dish set up for solid content 86 24 3.10 87 Zeta Particle Size Analyzer Schematic 25 3.11 88 Particle Size Analyzer Set up 26 3.12 Ecotex Soft-flow dyeing machine 103 27 3.13 Closed Jigger machine 104

LIST OF FIGURES

28	3.14	100% cotton woven fabric current process flow diagram in Jigger machine	107
29	3.15	100% cotton woven fabric modified process flow diagram in Jigger machine	107
30	3.16	100% viscose woven fabric current process flow diagram in Soft flow machine	109
31	3.17	100% viscose woven fabric modified process flow diagram in Soft flow machine	110
32	3.18	100% cotton knitted fabric current process flow diagram in Soft flow machine	111
33	3.19	100% cotton knitted fabric modified process flow diagram in Soft flow machine	112
34	3.20	Tegawa scale	113
35	3.21	Drop test setup	114
36	3.22	Reactive Dyeing Cycle	117
37	3.23	Colour Eye Spectrophotometer	118
38	3.24	Lloyd tensile strength testers	119
39	3.25	Elmendrof tear strength tester	120
40	3.26	TDS meter	122
41	4.1	EDA in a glass beaker	125
42	4.2	PWA in a glass beaker	125
43	4.3	1% dispersion of EDA in soft and hard water	127
44	4.4	1% dispersion PWA in soft and hard water	127
45	4.5	Check foaming test of 1% dispersion of PWA in water	128
46	4.6	Check foaming test of 1% dispersion of EDA in water	128
47	4.7	EDA in a glass bottle for $40^{\circ}C$ stability test	129
48	4.8	<i>PWA</i> in a glass bottle for 80° C oven for stability test	129
49	4.9	Particle size and size distribution of EDA	130
50	4.10	Particle size and size distribution of PWA	131
51	4.11	Zeta Potential and zeta deviation of EDA	132
52	4.12	Zeta Potential and zeta deviation of PWA	132
53	4.13	Optimization concentration of EDA in cotton woven desizing	133
54	4.14	Optimization of pH in cotton woven desizing	133
55	4.15	Optimization of bath Temperature in cotton woven desizing	134
56	4.16	Optimization of quality of water in cotton woven Desizing	134

Index

57	4.17	Optimization of dwell time in Cotton woven Desizing	134
58	4.18	Optimization concentration of PWA in cotton woven Scouring & bleaching	135
59	4.19	Optimization of bath Temperature in cotton woven scouring & blg	135
60	4.20	Optimization of conc of NaOH in cotton woven Scouring and bleaching	135
61	4.21	Optimization of dwell time in cotton woven Scouring and bleaching	135
62	4.22	Optimization of quality of water in Cotton woven Scouring andbleaching	136
63	4.23	Optimization concentration of EDA in viscose woven desizing	136
64	4.24	Optimization of pH in viscose woven desizing	136
65	4.25	Optimization of bath Temperature in viscose woven Desizing	137
66	4.26	Optimization of quality of water in viscose woven desizing	137
67	4.27	Optimization of dwell time in viscose woven desizing	137
68	4.28	Optimization concentration of PWA in cotton knitted scouring & bleaching	138
69	4.29	Optimization of bath Temperature in cotton knitted scouring & blg	138
70	4.30	Optimization of conc of NaOH in cotton knitted scouring and bleaching	138
71	4.31	Optimization of dwell time in cotton knitted Scouring and bleaching	138
72	4.32	Optimization of quality of water in cotton knitted Scouring and bleaching	139
73	4.33	Tegawa stain on currently processed and modified processed100% cotton woven fabric.	140
74	4.34	Tegawa stain on currently processed and modified processed100% viscose woven fabric.	140
75	4.35	<i>Effect of modified pretreatment on tensile strength of fabrics</i>	144
76	4.36	<i>Effect of modified pretreatment on percentage strain of fabrics</i>	144
77	4.37	<i>Effect of modified pretreatment on tearing strength of fabrics</i>	145