

# Contents

## Part I Conjugacy Classification of Pseudo-periodic Mapping Classes

<b>1</b>	<b>Pseudo-periodic Maps</b>	3
1.1	Basic Definitions	3
1.2	Nielsen's Results on Pseudo-periodic Maps	6
<b>2</b>	<b>Standard Form</b>	17
2.1	Definitions and Main Theorem of Chap. 2	17
2.2	Periodic Part	20
2.3	Non-amphidrome Annuli	20
2.4	Amphidrome Annuli	35
2.5	Proof of Theorem 2.1	47
<b>3</b>	<b>Generalized Quotient</b>	53
3.1	Definitions and Main Theorem of Chap. 3	53
3.2	Proof of Theorem 3.1	60
3.3	Quotient of $(\mathcal{B}', f _{\mathcal{B}'})$	61
3.4	Re-normalization of a Rotation	61
3.5	Re-normalization of a Linear Twist	71
3.6	Re-normalization of a Special Twist	83
3.7	Completion of Theorem 3.1. (Existence)	91
<b>4</b>	<b>Uniqueness of Minimal Quotient</b>	93
4.1	Main Theorem of Chap. 4	93
4.2	Structure of $\pi^{-1}$ (arch)	97
4.3	Structure of $\pi^{-1}$ (tail)	103
4.4	Structure of $\pi^{-1}$ (body)	107
4.5	Completion of the Proof of Theorem 4.1. (Uniqueness)	113
4.6	General Definition of Minimal Quotient	118
4.7	Conjugacy Invariance	119

<b>5</b>	<b>A Theorem in Elementary Number Theory</b> .....	131
5.1	Proof of Theorem 5.1. (Uniqueness) .....	132
5.2	Proof of Theorem 5.1. (Existence).....	135
<b>6</b>	<b>Conjugacy Invariants</b> .....	145
6.1	Partition Graphs .....	149
6.2	Weighted Graphs .....	151
6.3	Completion of the Proof of Theorem 6.1 .....	162
6.4	Weighted Cohomology .....	164
 <b>Part II The Topology of Degeneration of Riemann Surfaces</b>		
<b>7</b>	<b>Topological Monodromy</b> .....	173
7.1	Proof of Theorem 7.1.....	175
7.2	Construction of $\Delta$ and $\{N_i\}_{i=1}^s$ .....	176
7.3	The Decomposition $F_\xi = A_\xi \cup B_\xi$ .....	177
7.4	Construction of a Monodromy Homeomorphism.....	177
7.5	Negativity of Screw Numbers.....	181
7.6	Completion of the Proof of Theorem 7.1 .....	185
<b>8</b>	<b>Blowing Down Is a Topological Operation</b> .....	189
<b>9</b>	<b>Singular Open-Book</b> .....	199
9.1	Completion of the Proof of Theorem 7.2.....	211
9.2	Characterization of the Triples $(S, Y, c)$ That Come from Pseudo-periodic Maps.....	213
9.3	Completion of the Proof of Theorem 9.2.....	218
9.4	Concluding Remark .....	220
<b>A</b>	<b>Periodic Maps Which Are Homotopic</b> .....	221
<b>References</b> .....		233
<b>Index</b> .....		237