C O N T E N T S

Preface III

Chapter I Fundamental Concepts – Measure and Calculability 1

1. The Notion of Measure 1
2. Examples in Measures with Applications 4
3. Adequacy of Measures 12
4. Geometrical Category of Homotopic – Simplicial Spaces 18

Chapter II DGA and Minimal Model 20

1. Notion of DGA and its Homology 20
2. DGA-Morphisms and Homotopy of DGA's 24
3. Minimal Model of a DGA-Existence 29
4. Minimal Model of a DGA-Uniqueness 34
5. Induced Morphisms of Minimal DGA's 41
6. Some Auxiliary Theorems about Twisted Products 50

Chapter III The DeRham – Sullivan Theorem and I^*-Measure 58

1. The DeRham – Sullivan Algebra of a Simplicial Complex and the deRham-Sullivan Theorem 58
2. The Weil DGA of a Complex 60
3. Proof of the deRham – Sullivan Theorem 66
4. Integration and Duality 78
5. Homotopy Invariance and Calculability of I^*-Measure 87

Chapter IV I^*-Measure and Homotopy 93

1. The Cartan – Serre Extension of a DGA and the Hurewicz Number . . . 93
2. The Cartan – Serre Extension of a Space 96
3. The Cartan – Serre Tower of a Space and the Hurewicz Homomorphism . . 101
4. Whitehead Products of Homotopy Groups 106

Chapter V I^*-Measure of a Homogeneous Space – The Cartan Theorem 116

1. DGA of Left-Invariant Forms on a Lie Group 116
2. Homogeneous Space and Invariant Forms – Method of E. Cartan 123
3. The Weil Algebra 127
4. The Cartan Algebra and the Theorem of Cartan 135

Chapter VI Effective Computation and Axiomatic System of I^*-Measure 143

1. An Extension Theorem 143
2. Union of Complexes along a Subcomplex 148
3. Some Particular Cases – Cone-Construction and Suspension 155
4. Effective Computation and Axiomatic System of I^*-Measure 161
5. Some Applications to Fibrations – Fiber Space Theorem 165
6. Some Applications to Fibrations – Transgression and a Theorem of Borel-Hirsch 173

Chapter VII I^*-Measures Connected with Fibrations 178

1. Some Algebraic Preparations 178
2. Simplicial Fibration and some Spectral Sequences 184
3. Fiber-Square Constructions and Fiber-Square Theorem for I^*-Measures 191

4. Proof of the Fiber-Square Theorem 197
5. Fiber-Space Theorem and other Applications 202

Bibliography 214

Index 218