

CONTENTS

<u>Chapter I:</u>	Polynomial Ideals in Group Rings	1
	1. Polynomial ideals	1
<u>Chapter II:</u>	Dimension Subgroups	13
	1. Subgroups determined by polynomial ideals	13
	2. Dimension subgroups over arbitrary rings of coefficients	16
	3. Lie dimension subgroups over arbitrary rings of coefficients	18
<u>Chapter III:</u>	Group Rings of Nilpotent Groups	20
	1. N-series and filtrations of the augmentation ideal	20
	2. A construction in group rings of nilpotent groups	22
<u>Chapter IV:</u>	Dimension Subgroups over Fields	36
	1. Dimension subgroups over fields	36
	2. Lie dimension subgroups over fields	44
	3. Applications	48
<u>Chapter V:</u>	Polynomial Maps on Groups and Dimension Subgroups	50
	1. Polynomial maps	50
	2. A characterization of polynomial maps on groups	55
	3. Wreath product	57
	4. Relationship with dimension subgroups	58
	5. Integral dimension subgroups	60
	6. The fourth integral dimension subgroup ...	66
	7. Modular dimension subgroups	73
<u>Chapter VI:</u>	The Residual Nilpotence of the Augmentation Ideal	76
	1. The nilpotence of the augmentation ideal .	76
	2. The residual nilpotence of the augmentation ideal	79
<u>Chapter VII:</u>	The Nilpotent Residue of an Augmentation Ideal ...	95
	1. Elements of infinite p-height	95
	2. $\Delta_Z^w(G)$ in periodic groups	97
	3. $\Delta_R^w(G)$ in finitely generated nilpotent groups	99
	4. $\Delta_R^w(G)$ over fields	101
	5. The intersection theorem	101

<u>Chapter VIII</u> : The Associated Graded Ring of a Group Ring	106
1. The associated graded ring of a group ring	106
2. The graded Lie ring associated to an N-series	106
3. The Lie ring $\mathfrak{g}_{\mathbb{Q}}(G)$	109
4. The Lie algebra $\mathfrak{g}_{\mathbb{F}_p}(G)$	109
5. The associated graded algebra of a group algebra	111
6. The associated graded ring of an integral group ring	115
7. The periodicity of the groups $Q_n(G)$	122
8. The homomorphism e_n	125
<u>References</u> :	130