Abstract

In Chapter 1, some necessary definitions and results from combinatorics and commutative algebra are presented.

In Chapter 2, we study the Hibi ring and its ideal. The results about Gröbner bases of Hibi ideals and some homological invariants of Hibi rings are recalled.

In Chapter 3, we study rank bounded Hibi subrings for planar distributive lattices. We show that if L is planar, then any rank bounded Hibi subring of $R[L]$ has a quadratic Gröbner basis. We also characterize planar distributive lattices L for which any proper rank bounded Hibi subring of $R[L]$ has a linear resolution. Moreover, if $R[L]$ is linearly related for a lattice L, we find all the rank bounded Hibi subrings of $R[L]$ which are linearly related, too.