

Abstract

In Chapter 1, some necessary definitions and results from commutative algebra and commutative combinatorial algebra are given. Our Chapter 1 is divided in two sections. In the first section all the basic definition and main results of graph theory are given. While in the second section we discussed the preliminaries of edge ideals and main results related to them where $S = K[x_1, \dots, x_n]$ is a polynomial ring in n variables over a field K .

In Chapter 2, we study the homological properties of edge ideals and their powers. We gave some results concerning to linear resolutions and linear quotients of edge ideals.

In Chapter 3, we study the edge ideals with constant depth functions. We discussed the result concerning to edge ideal of a complete bipartite graph and its depth function. For this we gave some definitions and results which leads to our final Theorem.