TUTTE POLYNOMIAL AND EHRHART POLYNOMIAL FOR ZONOHEDRON

SHATHA ASSAAD SALMAN & MANAR MUSAB FTEKAN

Applied Science Department, Applied Mathematics, University of technology, Iraq

ABSTRACT

A polytope play a central role in different area of mathematics, for this we take of polytope which is known as a zonohedron then defined the matroid and arithmetic matroid. Multiplicity Tutte polynomial and Ehrhart polynomial to a zonohedron Z(X) in 2-dimension and 3-dimension are also given. A detailed for (D.Moci) theorem are proved by using multiplicity Tutte polynomial and establish some corollaries for the volume and the number of integral points of Z(X).

Theorem for the relation between the numbers of integral points on a zonohedron and the set of generating vectors with its proof is given. Combinatorial interpretation of the associated multiplicity Tutte polynomial with different examples is presented to demonstrate our results.

KEYWORDS: Ehrhart Polynomial, Tutte Polynomial, Zonohedron