

## SOME NEW RESULTS ON DISTANCE ENERGY OF GRAPHS

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**Abstract:** The sum of absolute values of eigenvalues of distance matrix of a graph is defined as distance energy of graph. We investigate distance energy for the larger graph obtained from any arbitrary graph by means of various graph operations. The concept of equienergetic graph is also explored in the context of distance energy of graph.

**Keywords and Phrases:** Eigenvalues, Graph Energy, Distance Matrix, Distance Energy.

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### 1. Introduction

Let  $G$  be a simple connected graph on  $n$  vertices and  $v_1, v_2, \dots, v_n$  be the vertices of a graph  $G$  then distance between any two vertices is defined as the length of shortest path between them. The distance between vertices  $v_i$  and  $v_j$  is denoted by  $d_{ij}$ . The diameter of graph  $G$  is denoted by  $diam(G)$  and is defined as the maximum distance between any pair of vertices of  $G$  [3, 5].

The concept of graph energy was introduced by Gutman [11] and it is defined as the sum of absolute values of eigenvalues of adjacency matrix of graph  $G$ .

$$\mathcal{E}(G) = \sum_{i=1}^n |\lambda_i|$$