South East Asian J. of Mathematics and Mathematical Sciences
Vol. 17, No. 2 (2021), pp. 225-232

ISSN (Online): 2582-0850

ISSN (Print): 0972-7752

DOMINATION POLYNOMIALS OF THE JEWEL GRAPH AND ITS COMPLEMENT

E. Selvi and R. Kala

Department of Mathematics,
Manonmaniam Sundaranar University,
Abishekapatti, Tirunelveli - 627012, Tamil Nadu, INDIA

E-mail : selvie173@gmail.com, karthipyi91@yahoo.co.in

(**Received:** *Jan. 17, 2021* **Accepted:** *Jul. 19, 2021* **Published:** *Aug. 30, 2021)*

Abstract: Let $G = (V(G), E(G))$ be a simple graph. The Jewel graph J_n is a graph with vertex set $V(J_n) = \{u, v, x, y, u_i : 1 \leq i \leq n\}$ and edge set $E(J_n) = \{ux, uy, xy, xv, yv, uu_i, vu_i : 1 \leq i \leq n\}$. The domination polynomial of a graph G of order n is the polynomial $D(G, x) = \sum_{i=\gamma(G)}^{n} d(G, i)x^i$, where $d(G, i)$ is the number of dominating sets of G of cardinality i. In this paper, we present various domination polynomials of the Jewel graph J_n. Also we determine the same results for the complement of the Jewel graph.

Keywords and Phrases: Domination polynomial, Jewel graph..

2020 Mathematics Subject Classification: 05C31, 05C69.

1. Introduction

Let $G = (V, E)$ be a simple graph with vertex set $V = V(G)$ and edge set $E = E(G)$. A set $D \subseteq V$ is a dominating set if every vertex in $V - D$ is adjacent to a vertex in D. The domination number $\gamma(G)$ is the minimum cardinality of a dominating set in G. A dominating set with cardinality $\gamma(G)$ is called a γ-set. For a detailed treatment of this parameter the reader is referred to [8].

A dominating set $D_i \subseteq V(G)$ is an independent dominating set [5] if the induced subgraph $\langle D_i \rangle$ has no edges. Independent domination number is the minimum size of an independent dominating set of G and is denoted by $i(G)$. A dominating set $D_t \subseteq V(G)$ is a total dominating set [5] if the induced subgraph $\langle D_t \rangle$ has