South East Asian J. of Mathematics and Mathematical Sciences
Vol. 18, No. 1 (2022), pp. 387-396

ISSN (Online): 2582-0850

ISSN (Print): 0972-7752

CONNECTED FORCING NUMBER OF CERTAIN GRAPHS

Chitra Suseendran and P. K. Lakshmi Priya

Department of Mathematics,
Ethiraj College for Women, Egmore,
Chennai - 600008, Tamil Nadu, INDIA

E-mail : chitrasuseendran@gmail.com, lakshmipriya7597@gmail.com

(**Received:** *Jan. 16, 2021* **Accepted:** *Apr. 12, 2022* **Published:** *Apr. 30, 2022)*

Abstract: Given a simple graph $G = (V, E)$ with a set $S \subseteq V$, to be an initial set of coloured vertices called black vertices and all remaining vertices being uncoloured, called white vertices. At each integer valued time step, a coloured vertex in the set S with a single uncoloured neighbour will force that neighbour to get coloured and such a vertex is called a forcing vertex and the set S is called a forcing set, if by relatively applying the forcing process, all of V becomes coloured. The forcing number of a graph G is the cardinality of the smallest forcing set of G and it is denoted by $F(G)$. One of the variants of forcing, namely connected forcing, is a restriction of forcing in which initial set of coloured vertices induces a connected subgraph. The connected forcing number, $F_c(G)$ of a graph G, is the minimum cardinality among all connected forcing sets of G. In this paper, we determine $F_c(G)$ of degree splitting graphs and line graphs of certain graphs. Further we discuss on its bounds and the realizability theorem.

Keywords and Phrases: Forcing, Forcing number, Connected forcing, Connected forcing number, Degree splitting graphs, Line graphs.

2020 Mathematics Subject Classification: 05C15, 05C69.

1. Introduction

Unlike a static colouring process of a graph G, a dynamic colouring process, considers a subset $S \subseteq V(G)$ as an initial set of coloured vertices (black vertices) known as a zero forcing set or forcing set or propagation set or by several other