

## PCCP OF CIRCULAR GRAPH FAMILY WITH A FAN GRAPH

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(Received: Jan. 13, 2021 Accepted: Jan. 24, 2022 Published: Apr. 30, 2022)

**Abstract:** A function  $f : V(G) \cup E(G) \cup R(G) \rightarrow C$  is said to be perfect coloring of the graph  $G$ , if  $f(x) \neq f(y)$  for any two adjoint or incident elements  $x, y \in V(G) \cup E(G) \cup R(G)$ . And the PC number  $\chi^P(G)$  is the least number of colors needed to assign colors to a graph by using perfect coloring. In this paper, we prove the results for perfect chromatic number of corona product (PCCP) of circular (cycle) graph family and a fan graph, which leads to perfect chromatic number equivalent to  $\Delta+1$ , where  $\Delta$  is the largest degree of the resultant graph.

**Keywords and Phrases:** Graph coloring, corona product, perfect coloring.

**2020 Mathematics Subject Classification:** 05.

### 1. Introduction

Graph coloring is a preeminent element of graph theory. It is having huge implementations in abundant disciplines like aircraft scheduling, register allocation, sudoku, mobile networking etc. The four color theorem plays important role in graph coloring [2]. The result of four color theorem was proved using PRN of that graph by Bhapkar [7]. The graph coloring basically deals with vertex, region and edge coloring. The coloring of elements (vertex, region or edge) of a connected graph such that adjoining element should receive dissimilar colors is the graph coloring. And the least colors needed to color a graph is the chromatic number [4]. The total coloring is coloring the vertices and edges of the graph so that no two adjoint vertices, vertices and its incident edges should not receive the same color. The minimum number of colors required to color graph  $G$  using total coloring is