

## CYCLIC DISTANCE IN GRAPHS

Annie Sabitha Paul and Raji Pilakkat\*

Department of Mathematics,  
Government College of Engineering,  
Kannur, Kerala - 670563, INDIA

E-mail : anniesabithapaul@gmail.com

\*Department of Mathematics,  
University of Calicut,  
Malappuram, Kerala - 673635, INDIA

E-mail : rajipilakkat@gmail.com

(Received: Oct. 04, 2020 Accepted: Jan. 17, 2021 Published: Apr. 30, 2021)

**Abstract:** In this paper the concept of cyclic distance is introduced. For  $u, v \in V(G)$  of a connected graph  $G$ , the cyclic distance between  $u$  and  $v$  is defined as the minimum number of cycles to be traversed from a cycle containing  $u$  to a cycle containing  $v$ . Using this notion, cyclic radius and cyclic diameter of a graph are defined. Cyclic distance matrix of a graph is also introduced and some of its properties are studied.

**Keywords and Phrases:** Cycle neighbor set, maximal cyclic component, cyclic radius, cyclic diameter, shrunked graph, cyclic distance matrix.

**2020 Mathematics Subject Classification:** 05C12.

### 1. Introduction

All graphs  $G = (V(G), E(G))$  discussed in this paper are simple, finite, connected and undirected. For notation and terminology we refer to [2, 3]. Different types of distance concepts like detour distance [4], superior distance [7], etc., can be found in the literature of graph theory. Recently M. P Jalsiya and Raji Pilakkat [6] introduced the concept of transitively tracked graphs. This motivated the authors to define a new distance concept called cyclic distance in graphs.