Khoirul Rokhim, 2019, Implementation of Flower Pollination Algorithm (FPA) to Complete Open Vehicle Routing Problem (OVRP). This undergraduate thesis was supervised by Asri Bekti Pratiwi, S.Si., M.Si. and Dr Herry Suprajitno, M.Si., Mathematics Department, Faculty of Science and Technology, Airlangga University, Surabaya.

ABSTRACT

The purpose of this thesis is to complete the Open Vehicle Routing Problem using Flower Pollination Problem. Open Vehicle Routing (OVRP) is one variation of the Vehicle Routing Problem (VRP), which is a problem of determining vehicles routes, in order to find routes which have the minimum costs without violating vehicle load capacity constraints, and the vehicles does not return to the depot after serving the last customer. OVRP focuses on problem where the company does not have vehicles to distribute products to customers. This problem forces the company to rent vehicles to realize product distribution. Flower Pollination Algorithm (FPA) is one of the algorithms inspired by nature, namely from the process of pollinating flowers on plants. In FPA, there are two key steps namely local pollination and global pollination determined by switch probability. The programming language used in this thesis is Java which is implemented in three cases, namely small data with 18 customers, medium data with 75 customers, big data with 100 customers and the cost per unit distance is € 0.6 and rent cost is € 15 per vehicle. Based on the program implementation, the total costs of each data are € 155.3618, € 1194.7476, and € 1609.2984, respectively. Output result of the program indicates that higher number of maximum iterations and flowers, and greater switch probability, the solution for OVRP is better with a minimum total cost incurred.

Keyword: Flower Pollination Algorithm (FPA), Open Vehicle Routing Problem (OVRP).