

## ***ABSTRACT***

*PT XYZ is a company that produces GESITS Electric Motors. In the assembly process, there is a part namely the 5 kW BLDC Electric Motor which works as the main driver of this GESITS Electric Motor. To compose this section, there are eight workstations. From the condition of the existing assembly line, there are problems found in the production target competition. It is still at 32,26% of the total target. This condition happens due to the imbalance of the assembly line on the 5 kW BLDC Electric Motor. From these problems, there is a consideration for proposal using the Heuristic method. For the results of the proposal, the performance index in the form of Line Efficiency is 81% with a total of 25 workstations. For this research, improvements will be made with the Metaheuristic method using Genetic Algorithms. To apply the method (Genetic Algorithm) in the case of balancing the assembly line at PT XYZ, MATLAB application will be used. The code from the Genetic Algorithm method will be defined into the definition in MATLAB. With the calculations that have been made, the Line Efficiency number is 92% with the change from 25 to 23 workstations compared to the existing conditions using the Heuristic method.*

*Keywords: Assembly Line Balancing, Genetic Algorithm, MATLAB*