ABSTRACT

Piston pump which is reviewed in this study is a single-piston pump. Single piston pump consists of four elements that move within the system contained within a single piston pump is a float, rod, piston and water is pumped. The *buoy* serves as an object that is stored on the surface of sea water where the *buoy* will follow the motion of ocean waves that will help the piston to move up and down are connected by a rod. Piston contained in the cylinder is useful for pumping water that is inside the pump piston to generate a pressure difference that can be converted into electrical energy. The purpose of this final project is to reconstruct the system of equations of single piston pump and design the optimal conditions of the mass of the piston as control of the value of the pressure within the reservoir monotonous rise so that the value of the pressure within the reservoir can be controlled at a certain point. The method used to find solutions to the control system of equation single piston pump is the Runge-Kutta method 4 and tracking control systems of linear equations. The results of this study in the form of a graph of pressure that has been controlled by the variable mass and comparison of the energy produced by using the control and without control.

Kata Kunci : single piston pump, systems of linear equations, mass of piston, mass of *buoy*s, *Runge Kutta-4*