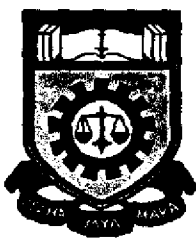


**CALIBRATION AND OPTIMUM CONTROL OF THE CASCADED
THREE TANKS PROCESS**

Thesis presented in partial fulfillment for the award of the
Bachelor of Electrical Engineering (Honours)
INSTITUT TEKNOLOGI MARA



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ABSTRACT

This is a thesis on calibration and optimum control to the cascaded three tanks process. Both theoretical and practical analysis procedures are included.

The theoretical section covers learning of the process and functions of each instrument in the model plant.

The practical section covers the calibration of the equipment involves in the process, tuning the controller of the model plant in order to ensure that they are in good working order. Besides the practical section, the optimum tuning of the PID controller using process reaction curve method, ultimate sensitivity method and auto-tuning method for an automatic control of tank level of the model plant will also be covered.

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CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

Automatic control has played a vital role in the advancement of engineering and science. In addition to its extreme importance in space-vehicle, missile-guidance and aircraft-piloting systems, etc., automatic control has become an important and integral part of modern manufacturing and industrial process. For example, automatic control is essential in such industrial operations as controlling pressure, temperature, humidity, viscosity, flow and level in the process industries. [8]

In this project, a cascaded three tank is using as a model plant to control the water level of the third tank. A PID controller is using as a mastermind of the process. The objective of this project is to calibrate the valve positioner, control valve and differential pressure level transmitter in order to ensure that the measurement is accurate and valid. Three tuning methods are also explored to find the optimum values of the PID parameters. They are process reaction curve; ultimate sensitivity and auto-tuning method.

1.1 SCOPE OF PROJECT

The scope of this project will be covered on study of the functions of each instrument and process flow of the model plant. Calibration of the equipment involved in the model plant and tuning methods is also explored in this project.