**CHAPTER 1**

**INTRODUCTION**

* 1. **Introduction to Elevator Control System**

Today electrical and mechanical power is widely used for transportation. Gradually, with the development of civilization and engineering, elevator can be controlled by special machines for transportation. An elevator control system is a up and down movement system designed to reach the destination floor. Elevators used to move loads from one height to another without disturbing the load itself. It is a very useful device that moves people to the designed floor in the shortest time. Elevators are generally powered by electric motors that drive the elevator car to move up and down.

Arduino based elevator control system is one of the advanced and developed system in elevator technology. For the last one hundred years, the availability of space for construction of the house and offices within towns and cities has continued to shrink. This has given the way to the construction of multi stories buildings based in the used of steel and iron as support structures by elevator. In addition, the elevator must provide a special link between the demand by the users and available access. Arduino is used as the major controller to construct elevator model and also used to control the operations of various hardware circuitries.

To accomplish the elevator control system, the design uses the major components; Arduino Mega, Stepper Motor, Stepper Motor Driver, Inductive Sensor, DC Motor, Seven Segment Display and other electronic components. An elevator, also known as lift, uses sensors to detect the floor and also contain electric motor to drive the elevator car. The goal of this system is to design a three floor elevator controlled system based Arduino. Arduino is used to control the whole process of elevator and pushbutton are used to be input by the user request. The display unit displays the position of elevator car. Stepper Motor drives the elevator car and DC Motor uses open/ close to door. Arduino compares the user request and the pushbutton to drive the elevator motor Up and Down. When the user request is greater than sensor value, the

motor drive forward goes Up and it is less than the sensor value, it goes down.

* 1. **Aim and Objectives**

The main aim and objectives of this thesis are as follow:

* To design and construct three floors elevator
* To take command from user and act on it to enable operation of the elevator
* To study the concepts of Arduino controller
* To express output result of Arduino
* To understand the function of the elevator control system
* To study the working principles of stepper motor and inductive sensor
* To analyze the elevator control system with simulation of Arduino

**1.3. Scope of the Thesis**

Design consideration of elevator control with Arduino is intended for up and down movement in high buildings. The required electrical supplied and motor capacity can be selected according to the number of floors. To complete design consideration of elevator control, the operation of Arduino and sensors are used. This device to be tested on the designed model. This thesis is also aimed to provide the following areas; modern high rise building, apartment building, supermarkets, hospitals, hotels and department stores.

* 1. **Implementation Program**

Overview considerations for implementation programs are:

* Studying the history of elevator control system
* Tracking the operation of elevator system and related theoretical background for actual elevator
* Designing the elevator control system by using Arduino controller
* Constructing the small scale model
* Testing and running the operation of elevator
* Studying the component of elevator control circuit
* To understand the operation of motor control
* To analyze the elevator control system with simulation of Arduino

**1.4. Outline of the Thesis**

During the course in this thesis, certain issues had to be addressed which was critical to the overall success of the project. These issues can be categorized into two

separated section. Software implementation and design and hardware implementation.

* 1. **Layout of the Thesis**

The overall content of the thesis consists of six chapters. The first chapter is about the introduction of the topic following by the recommended, and literature review is described in chapter two. Introduction of all components is expressed in chapter three. In chapter four, the contents are about design and hardware implementation and software implementation. In chapter five, the contents are about the test and results for the project. The conclusion and recommendation for the project is in the chapter six.