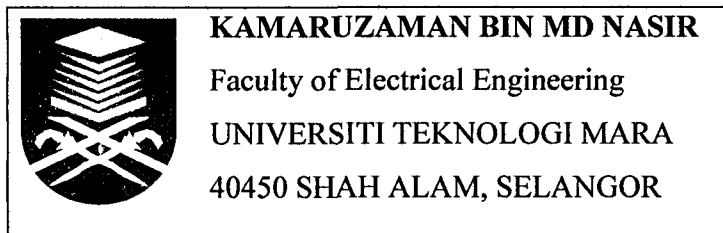


**PERFORMANCES OF THREE PHASE INDUCTION MACHINE  
RUNNING AS INDUCTION GENERATOR**

**This project report is presented in partial fulfillment for award of the Bachelor of  
Electrical Engineering (Hons)  
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## ABSTRACT

This thesis presents a report on investigation of performance three phase induction machine when it running as induction generator and characteristics of a three-phase with an excitation capacitor and load. The investigation is focused on the performances of the self-excited induction generator (SEIG) which include speed, torque, output voltage, output current, stator current, load current, output power, phase displacement angle and frequency. The data is measured by varying the speed of prime mover, capacitor value and load. The study also focused on voltage build up process of induction generator driven by a variable speed. The objective is to estimate the optimum values of capacitance required for self-excitation operated as a three-phase induction generators which generate maximum output power. The performance characteristics of different capacitor values for capacitor self-excited induction generator are also compared. Experimental results and performances of the induction machine are presented.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

In recent years, self-excited induction generators (SEIG) have been popular as power source in small hydroelectric and wind energy applications. It is conventionally use for small hydro schemes and wind power. It has many advantages compared to synchronous generator. It reduced unit cost and size, ruggedness, brushless (in squirrel cage construction), it not require separated dc source, ease of maintenance, self protection against severe overloads and short circuits, etc. Induction generator will generate the voltage if excitation capacitor connected to it. Excitation capacitor is important for this purpose of induction generator. It will excite the current to the stator terminal of induction machine. It known as self-excited induction generator [1].

It is well known that an externally driven induction machine can sustain self-excitation when appropriate value of a capacitor bank is properly connected across its stator terminals [2]. An induction generator is an induction machine which mechanically coupled to drive shaft to rotate. Induction generator has a variable voltage characteristic in due to variable speed of drive shaft and frequency characteristic determined by the frequency characteristic of an excitation input applied.