Chapter 1

Introduction

1.1 Background

Engineering students with less practical knowledge, often find it difficult to cope with the industrial environment after graduation. As a technologist, it is highly necessary to pursue practical training of what you are learning in the theoretical class, engineering students needs more practical learning in tertiary institutions, to help students gain practical skills, Transformers are crucial components in electrical power systems very useful in voltage transformation and power transmission (Chapman, 2017). it's important for engineering students to understand transformer operation and characteristics of transformers, A Transformer trainer is a set of electrical circuits that can be interlinked by students to perform open circuit, short circuit test etc. understanding transformers operations and characteristics is essential for electrical engineering students and professionals (kothari & Nagrath, 2019).

1.2 Problem Statement

Most institute teaching methods often focus more on theoretical aspects of transformers, leaving a gap in practical understanding (Kolb, 1984). A transformer trainer helps to bridge the gap by allowing students to conduct experiments and visualize transformer behavior.

1.3 Aim of the project

To design and construct a Transformer Trainer

1.4 Objectives

The objectives of this project are:

To Design a transformer trainer that allows students to perform experiments on transformers (Fitzgerald et al., 2005).

To construct a multifunctional energy meter module to accurately measure electrical parameters

To design and construct a device that can perform experiments on:

•short circuit test

•open circuit test

•on-load test

To design a laboratory model that will help students hands-on experiments so they can know how the transformer works

1.4 Scope

This project focuses on designing a transformer trainer, this particular transformer is an isolation transformer (i.e neither step up nor step down having 1-1 turn ratio) the trainer will help to know the basic transformer principles, Characteristics and testing procedures, Examples of Tests that can be carried out on this transformer trainer are: Short Circuits tests, Open circuit test, polarity test, this Transformer trainer input parameter is analog meter, which doesn't required to be pre-powered and also has a continuous reading value.