**Circuits (II)**

**Experiment (IV)**

**Transformers**

**Report By:**

**Aliaa Mohamed Ali Abbas 3747**

**INTRODUCTION:**

Transformer is one of the most used of electrical components in our daily life. Since the power source in our home give out a constant amount of power but our appliances uses different amount of electrical power to operate properly, transformer is therefore very useful in ensuring that all the appliances can work properly on the same power outlet.

Transformers divide into step-up and step-down transformers according to the ratio between the input voltage and output voltage.

**Definition**:

A transformer works on faraday’s laws of electromagnetic induction. A transformer consists of magnetic core, and it contains two windings.When one of the windings is connected to an alternating current supply, an alternating flux links with the other winding (secondary windings) inducing electromotive force (e.m.f.) in this winding at the same frequency as that of the power supply. This is known as mutual induction.

**Theory:**

The voltage on the coil of the transformer is directly proportional to the number of turns on the coils. This relationship is expressed by the formula

Where

VP = voltage on primary coil

VS = voltage on secondary coil

NP = number of turns on primary coils

NS = number of coils on secondary coils.

**OBJECTIVE:**

-Study the behavior of transformers.

-Obtain a practical measurement of (

**SCHEMATIC:**

****

**STEPS:**

-Connect the circuit as shown in the above schematic.

-Set the frequency to 1000 Hz and the resistance = 1000 Ω

- Change the input Voltage Vp (r.m.s value) between [4, 6 & 7] volts and measure the corresponding Vs and Ip Values as well as IS by Ohm's law I = V / R.

IS = VS / 1000.

Set up a table with the results and calculate the average and .

**RESULTS:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Is(mA)** | **Ip(mA)** |  | **Vs(rms)** | **Vp(rms)** |
| **1.78** | **1.86** | **1.04** | **2.15** | **1.86** | **4** |
| **1.75** | **2.82** | **1.61** | **2.12** | **2.82** | **6** |
| **1.74** | **2.27** | **1.87** | **2.14** | **3.27** | **7** |

|  |
| --- |
| )avg = (2.15+2.12+2.14)/3 = 2.13) |

|  |
| --- |
| ()avg = (1.78+1.75+1.74)/3 = 1.756 |

Error % = |2.13-1.756| / 2.13 x 100 = 17.6%.

**CONCLUSION:**

Transformers affect voltage in a relation directly propotional to the ratio between the number of turns of the coils. And affects current in a relation inversely propotiional to the number of turns of each coil. The error % (17.5( can be attributed to the power loss through flux decapitation as well as inside the coils themselves among other various reasons.