**Introduction:**

The two main objectives of this experiment were:

1. To study the operational characteristics of a single-phase transformer.
2. To measure power in a three-phase circuit using the two-wattmeter method.

**Procedure/Discussion:**

In Part A of this experiment, the nominal transformer ratio was determined to be 1.733 whereas the measured ratio was 1.738, yielding a percent error of 0.286%.

From the load, the *secondary* impedance magnitude was measured to be , with an impedance angle of . The *primary* impedance magnitude was measured to be .

The voltage regulation for the R-load transformer circuit was 3.356% and 4.55% for the RL-load transformer circuit.

And finally, the power efficiency for the R-load was 85.1% and 66.66% for the RL-load.

For Part B of this experiment, the series RL transformer circuit had a theoretical and experimental wattage of 11.32 W and 13.5 W respectively, yielding a 19.258 % error. The theoretical power factor and experimental power factor, however, were 0.375 and 0.338 respectively, yielding a 9.67 % error.

The series RL // C transformer circuit had a theoretical and experimental wattage of 8.3 W and 9 W respectively, yielding a 8.434 % error. The theoretical power factor and experimental power factor, however, were 0.918 and 0.949 respectively, yielding a 3.39 % error.

**Conclusion:**

For the power-efficiency calculations, it should be noted that these are very old electrical components and most definitely non-ideal transformers thus resulting in flux leakage and thus loss in efficiency.

The larger percent error on the wattages is confusing. The formula in the lab manual was followed, however it was the missing value of the current I that seems to be the source of said error. A value of I was determined based of the 208 volt source value from the variac, which may in fact be false as the reference voltage value.