EXPERIMENT NO: 6

ELECTRICAL ENGINEERING

OBJECT: O.C. and S.C tests on a single phase transformer.

AIM: To perform the O.C and S.C tests on the given single phase transformer and to calculate the parameters of the equivalent circuit ,regulation and efficiency at any load.

CONNECTION DIAGRAM:

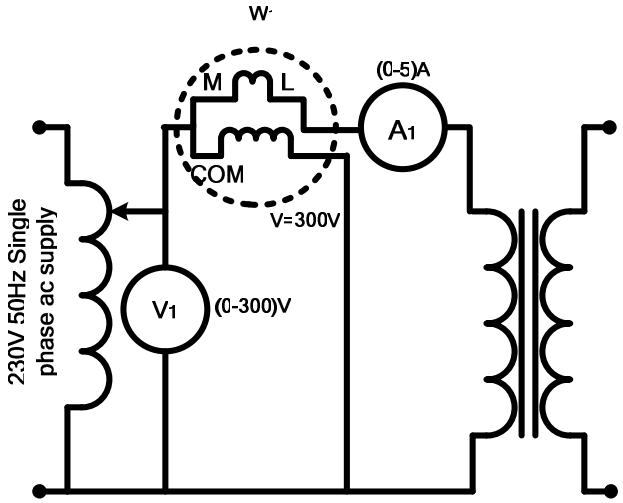

Fig A- O.C. Test

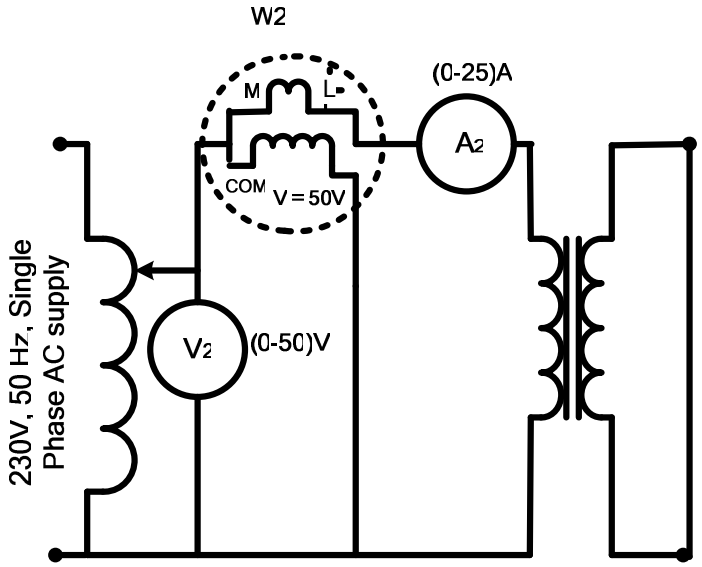

Fig B- SC Test

APPARATUS REQUIRED: The single phase transformer to be tested Two voltmeters, Two ammeters, Two watt meters (the range of these will

depend on the name plate reading of the transformer. It may possible to use the same meters for the both tests, if they have many ranges), single phase auto transformer.

PROCEDURE:

O.C Test: Connect as shown in figure A. Apply the rated voltage to the transformer primary winding. The primary current will be about 10-20% of the full load current. So choose the ammeter A, range accordingly. If the transformer has different voltages on two sides, which is normal case, the side which has the higher voltage should be kept open for good results and easy conduct of experiment. The wattmeter current coil range and pressure coil range should also be chosen (use LowPowerFactor (LPF) wattmeter) .

Keep it on about 2-3 min. and take readings of V_1, W_1,A_1. use correct multiplying factors for all three instruments, especially the Wattmeter. Switch off the supply.

S.C. TEST: Connect as in figure B. the current through the transformer winding should be the full load current and so choose the range of ammeter A_2 accordingly. Normally the side which is lower voltage should be short circuited for easy conduct of experiment and measurements done on the high voltage side. Apply a small voltage only to the transformer winding so that ammeter A_2 reads full load current. For this test V_2 should be of low range. Wattmeter current coil range must be high and pressure coil range is low. Take readings of V_2, W_2, and A_2. Use correct multiply factors. Switch off supply.

OBSERVATION:

O.C. TEST			S.C.TEST		
V_1	A_1	W_1	V_2	A_2	W_2

QUESTIONS:

(1) Draw the equivalent circuit of the transformer and mark the values of all parameters calculated from the test results (say for high Voltage sides)
(2) Calculate regulation for 0.8 pf lagging full load condition.
(3) Calculate efficiency for unity power factor and half load conditions.