** East West University**

**Course No: CSE109 Lab**

**Experiment Number:** 05

**Experiment Name:** Verification of MAaximum Power Transfer Theorem.

**Date of Experiment: 27/10/2016**

**Date of submission: 03/11/2016**

**Group: 5**

**ID: 2016-1-60-053**

**2016-1-60-057**

**2016-1-60-058**

**2016-1-60-060**

**Experiment Number:** 05

**Experiment Name:** Verification of Maximum Power Transfer Theorem.

**1. Objectives:** The objectives of this experiment is to verify the Maximum Power Transfer Theorem using laboratory experiment.

**2. Equipment / Apparatus:**

(i) DC Voltage Source (01)

(ii) Decade resistance box (01)

(iii) Resistors (RTH= 1000 ohm)

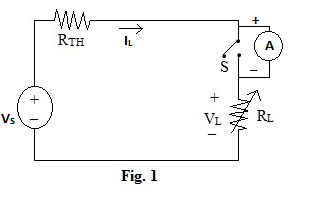
(iv) Multi-meter (01)

(v) Ammeter(01)

(vi) Breadboard

(vii) Wires

**3. Experimental Setup:**



**4. Procedure:**

(i) Measure the resistance of the resistor **RTH** by using the multi-meter.

(ii) Set the resistance of the decade resistance box equal to 500 ohm by measuring the resistance with the multi-meter, i.e., set **RL** = 500 ohm.

(iIi) Connect the circuit as shown in **Fig. 1** in breadboard.

(iv) Turn on the DC voltage source and measure it's voltage **VTH** by using the multi-meter. Adjust the voltage changing KNOBs of the voltage source such that the output voltage becomes **I5 V**.

(v) Open the switch S and measure current **IL­** by using the ammeter. Close the switch S.

(vi) Measure voltage **VL** across the resistor **RL** by using multi-meter.

(vii) Repeats steps (ii) to (vi) with different values of **RL** shown in Data Table below.

(viii) Perform the calculation of power **PL** an Data Table below for each observation.

**5. Data Table:**

**RTH = 952 ohm**

**VTH = 15 V**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Obs.**  **No.** | **RL (**ohm**)** | **VL** (volt) | **IL** (mA) | **PL =VLIL**  **(**mW) |
| 1 | 500 | 5.31 | 10 | 53.1 |
| 2 | 600 | 5.59 | 9.5 | 53.105 |
| 3 | 700 | 6.15 | 9 | 55.35 |
| 4 | 800 | 6.65 | 8.5 | 56.53 |
| 5 | 900 | 7.5 | 8 | 56.8 |
| 6 | 950 | 7.3 | 7.8 | 57.33 |
| 7 | 1000 | 7.5 | 7.5 | 56.25 |
| 8 | 1050 | 7.6 | 7.3 | 55.48 |
| 9 | 1100 | 7.7 | 7.1 | 54.67 |
| 10 | 1200 | 8.1 | 6.6 | 53.46 |
| 11 | 1300 | 8.2 | 6.1 | 50.02 |
| 12 | 1400 | 9 | 5.1 | 45.9 |
| 13 | 1500 | 9.01 | 4.5 | 40.51 |

**6. Questions & Answers:**

(i) Ploat PL vs RL and determine the value of RL for which the load power PL is the maximum. Do the experiment result verify the Maximum Power Transfer Theorem ? Why are you gatting some discrepancies?

**Answer:**

Here x-axis represents RL and y-axis represents PL .

‑

Our RTH = 952 ohm. So in x-axis at the point of RL= 952 we get the maximum value of

PL = 57.33. So our experiment results verifies the Maximum Power Transfer Theorem.

(ii) Ploat VL vs RL and comment on curve.

**Answer:**

Here x-axis represents RL and y-axis represents VL .

Here rising of resistance RL is proportional to VL. So when RL is increasing VL is also increasing.

(ii) Ploat IL vs RL and comment on curve.

**Answer:**

Here x-axis represents RL and y-axis represents IL .

­

Here rising of resistance RL is disproportionate to IL. So when RL is increasing IL is decreasing.

**8. Discussion:**

(i) For measuring current we have to use the exact value of ammeter Errors less than 10-3 will be ignored.

(ii) Measuring the resistance of resistors we have to remember that human hand can effect on the value of resistance. We have to avoid them.

(iii) When calculating data we should be very careful for approximate values.